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The Architectural Treatment of Aspect.

THE question of the aspect of a dwelling-house is one of primary architectural importance. It is intimately connected with the choice of site. In such cases as that of the designing of a mansion to stand within its own grounds, the question of the aspect, or of what in churches is called the orientation, of the building, is quite as important as is that of pictorial fitness, whether we apply the latter term to describe the effect produced on the observer by the situation of the house, as referred to the landscape, or with reference to the views to be commanded from the windows of the apartments.

Again, in places where the choice of site is narrowly limited, it may be in the power of the architect to pay such attention to aspect as will make all the difference between a comfortable, or even a healthy, dwelling, and one that is neither the one nor the other.

It is a not unfrequent complaint among writers on architectural subjects that the important question of aspect has by no means received its full share of practical attention. And although valuable hints are to be found in well-known books, we very much question whether such a thorough discussion of the subject as that of which we propose to indicate the outline, and which is based chiefly on experience of both architectural design and domestic habits in Italy, is at all familiar to the English reader, student, or builder.

A difference between the value of aspect in England and in Italy of course exists. This difference has to be taken into account. It is chiefly, but not altogether, a question of degree. The severity of the seasons differs in the two countries, although not so absolutely as at first sight may appear to be the case. The summer heat of Italy is distinguished from that of England rather by its greater duration and regularity than by maximum thermometric temperature. In some summers, and some aspects, we may have a day or two of summer heat in this country which is practically more intolerable than the ordinary summer heat of Italy; in consequence, in great measure, of the want of those provisions against heat which are not generally familiar to English people. Again, though our winters are longer, colder, and darker than those of Italy, the effect in that climate of the *tramontana*, or cold north wind, which rushes down from lofty and often snow-covered mountains, is more to be dreaded than is that of the north wind with us. As to the water-bringing winds in this country, they are very trifling in their meteoric effects if compared with the sudden deluge often thrown on the shores of the Mediterranean by the *sirocco*. Probably the only difference of kind is with regard to the east wind. The noxious effects of this wind, in the United Kingdom, are well known; and, indeed, the pernicious effect of a long-continued east wind it is not easy to exaggerate. In Italy the east wind is not a source of annoyance; the two directions of the atmospheric current which chiefly trouble the serenity of the climate of that peninsula being the sudden chill of the *tramontana*, or *mistral*, and the vaporous heat, and volleying rain, of the *sirocco*.

The aspect which has been recommended as the best in England is the south-east. On the other hand, the south-west has been described as the most unsuitable for a dwelling-room; and that on the two opposite grounds of the late continuance of sunshine in that direction and of the exposure to the most rainy winds. Before either admitting or disputing the truth of this view, it is desirable to consider what is required within a dwelling as well as without. After all, a house has four aspects, though one or more of them may be closed by a blank wall. Our first inquiry should be as to the domestic uses proper to each aspect; and if these be clearly established with regard to a country mansion or building of architectural importance, we shall obtain a guide or set of principles which may be advantageously borne in mind in the designing of even the humblest cottage.

Direct orientaton, such as that which is, within certain limits, the rule of the ecclesiastical architect, is not always possible in a house, and this fact leads to the remark that rules which may be advantageously laid down for a house that stands due north and south, or east and west, will require modification according to every change in the angles of azimuth; but it is easier to speak, in the first instance, of what we may call the square aspect than it is to introduce, at every step of our inquiry, those modifications of statement which vary with every degree of change in the position of the plan as measured by the compass. We wish to bear particularly in mind the facts collected by residence in a large Italian palace, charmingly situated in its own grounds, of which the pictorial site consisted with a square orientation.

The great foe which it is desirable to exclude from an English house is the east wind. It may be questioned whether it is advisable, on sanitary grounds, as well as for what we may call for want of a better word, military reasons, to build a large house with an unpierced wall on either side. But we think few persons who have had the practical opportunity of studying the subject will doubt that, during the cold east winds of which we have sometimes a continuance for as much as an eighth portion of the year, to have few apertures, and those capable of hermetic closure, towards the east, is an arrangement that conduces, in an extraordinary degree, not only to the warmth of a house, but to the general comfort of its inhabitants.

As to rain, on the other hand, the choice of aspect is comparatively unimportant. It is true that most of our rainfall is brought up by westerly winds; but it is hardly the case that the most driving rain comes from that quarter. There is sometimes very persistent and driving rain from the east. From the north, probably, the gusts are most frequent, or, at all events, most fierce, but in the case of thunder showers nothing can be predicted as to aspect. It is, moreover, far more easy to keep rain, however slanting its direction, out of a house, than it is to keep wind. The rapid patter of the hail, or of the large raindrops against the window, even if it have not a certain charm of its own, is certainly not to be regarded as a phenomenon attended by such discomfort as is the searching drought of a black east wind.

Again, our national habits have to be borne in mind. Amongst those of us who are fortunate enough to be able to build, or to inhabit, large country-houses, and to dispose at will of the whole twenty-four hours, the ordinary habits are totally different from those of the Italian nobility. Thus, rising with the dawn is not a usual custom with the English gentry, in the summer. Nine o'clock is regarded as meritoriously early, rather than otherwise, as a breakfast hour. And it is the usual custom of the Englishman in easy circumstances to do nothing in the way of business or serious occupation before breakfast.

With the Italian nobleman or gentleman the case is different. He has to count, he knows, on six weeks or two months of sultry weather, and on, perhaps, six months without any rain, unless it be an occasional thunder-shower. Thus, as a rule, in summer, he passes an hour or two at noon in sequestered repose. On the other hand, the beauty of the morning is so great, the charm of the climate at an early hour is so irresistible, that four a.m. is an ordinary hour for rising in summer, from the king to the lazzarone. And the morning drive, ride, or even walk, brought to a close, perhaps, by six a.m. is often the very cream of the enjoyment of the day.

These facts have led to an application of the eastern aspect, in Italian palaces, in a manner not to be recommended in this country. As we have before said, there is no need carefully to wall out the east wind in Italy. In England that need is felt, and often very severely felt. Thus the advantage of a window that admits the first rays of the sun is appreciated by these early risers. For persons who do not think of rising much before eight, the admission of those rays is in every respect undesirable; and bearing in mind the disuse of window shutters,—a change in the finish of the house originally due to the scamping builder,—which has unfortunately become so prevalent, an eastward-looking bedroom window may involve the loss of valuable hours of refreshing sleep.

It is not only the case that the eastward aspect is desirable for the best bedrooms in Italy, for the sake of the early risers, who form, indeed, the great majority of the population. There is a further great advantage in that aspect in the Italian peninsula. For three-fourths of the

time that the sun is above the horizon, or thereabouts, his direct rays do not strike on the eastern side of a wall built north and south. The consequence is that a room with an eastern aspect is cooler for the greater part of the day than any other. It is cooler than a northern-looking room, on which, in the summer, the direct rays fall in the evening, as well as in the morning. Thus, it is often the case in the more perfectly arranged Italian palaces that the *sala da mangiare*, or dining-room, occupies the east side of the house. In the case which we have more particularly in view (which is that of a very noble building in the plain of Sorrento, which was a favourite summer residence, visited by the Queen of Naples in the days when Nelson was in command of the British fleet in the Mediterranean), the dining-room is placed in the middle of the east side of the house. It runs east and west, being some 30 ft. in length by about half that breadth. In consequence, it has only one window, which occupied the greater part of the east end of the room, and looks down on a small garden, walled off from the rest of the garden grounds which surrounded the palace. Substantial wooden shutters, made with *Persiane*, or Venetian blinds, open or close without this large window. They are intended to be closed before sunrise, and not opened until the sun has got so far to the south that his beams cannot strike on the window. Then they should be opened for the rest of the day, as well as the window itself. The result will be a delicious temperature. In summer the room was used for breakfast, then left for a time closed; and in the afternoon it became available as a cool retreat. In the palace in question there was, however, a choice of summer, as well as of winter, apartments. The centre of the principal floor was occupied by a large room, 60 ft. by 40 ft. and 30 ft. high, which had five windows to the south. These were, of course, closed by shutter-blinds till the sun was off, and by this simple precaution a very agreeable temperature may be maintained for the whole year; the summer never being too oppressive, and the winter not requiring fires. A smaller drawing-room, to the north, opened into this large room by double doors. From a large window, with a projecting balcony, over the *portone* or carriage-entrance into the inner court (round three sides of which the house was built), this room commanded a superb view of the Bay of Naples. The effect of aspect, however, was here to be remarked. Three or four times in the year, so violent a gale, blowing over Vesuvius from the east, and deflected in some extraordinary manner by the mountains on the north of the bay, drove right on this window that no glass of large dimensions could have resisted it without the protection of the *Persiane*, or outer shutters. And in one corner of this room,—or rather where the corner would have been if the room had not been elliptical in shape,—the unusual luxury of a fireplace was hidden behind a screen that formed a portion of the dado when closed. In winter evenings a bright fire of olive wood was very cheerful in this charming apartment.

North, east, and south were thus all appropriated to the services of special apartments, and to the requirements of the various seasons, in this palace. To the west there were also windows, but the family chapel stood on that side of the palace, and a terrace on the roof of the chapel, on to which the windows of the *piano nobile*, or first floor, opened, made this part of the building rather useful for external, than internal, enjoyment of the prospect. In the winter afternoons, when the sloping rays of the sun fell on this terrace, it supplied the place of a winter-garden, or gave an always agreeable playground for the children, to which use the apartments on the west wing were devoted. If the house had been filled with visitors, and all the bedrooms had been made up on the second-floor (which was, no doubt, the original intention of the architect), a suite of seventeen fine rooms, including the great gallery or ball-room, would have been thrown open, one leading into another, on this fine floor.

If we apply the experience of domestic life in such a building as this to the design of a first-class country-house in an English park or self-contained estate, we shall find certain modifications to be demanded by the difference of the climate. In the first place, it would be requisite to provide chimneys and fireplaces for every room, and the whole system of thorough communication from room to room would require reconsideration in consequence. It would become questionable how far such a central apartment as that mentioned on the first-floor would be required by the customs of English life. Such a chamber could only be thoroughly useful in the country as a ball-room, and that fact would probably lead to its close for a great part of the year. Again, as the southern exposure would not be by any means sufficient, with every care, to warm this great apartment in the winter, the heating of it would become a serious problem. It is probable that the Saxon hall,—a vast apartment which gives entrance to the house, and round which smaller apartments very conveniently cluster,—is more appropriate to an English country mansion than the upper gallery or large drawing-room, which is so essential and charming a feature of a well-arranged Italian palace.

Again, in our climate, as before observed, the eastward aspect is neither desired for the principal bedrooms, nor necessary as a retreat from the afternoon heat; while the need of excluding the east wind from the house itself is great. Thus, the dining-room may conveniently occupy the eastern flank of the house. Probably the best arrangement, if the size of the plan suit, is to make that part of the building consist of two rooms, one of twice the length of the other,—rooms which double sliding doors would allow, on occasion, of being converted into one. Of these rooms the southern one, lighted by a large window from the south, would form the library, or the gentleman's morning-room, being square, or nearly so, in plan. The other, in the form of a parallelogram, would be the dining-room, on all occasions except such unusual ones as should require an extraordinary length of dining-table, when the two rooms could be used together. This room would be lighted from the north, and the unbroken side walls would afford ample space for pictures. It might, in some cases, suit the design better to make the length of the dining-room coincide with the east and west line, and to place this important apartment on the north of the house, lighted by three windows on that side, with the east end left blank, where a niche could be built for the sideboard. At all events, the general rule that the dining-room should occupy the north-east angle of the house; that any rooms devoted to study should adjoin it either on the north, if light be required for pictures or purposes of art, or on the south, if a snug morning of literary occupation enter the arrangements of the master, may, we think be safely recommended.

In the same way the south for the main reception-rooms, and the west for a boudoir or small drawing-room, may be regarded as favourable aspects. The great beauty of the English sunsets, especially to be prized by those who are not in the habit of seeing the sun rise, affords a picturesque charm which no architect is justified in shutting out from a fine mansion. As to the meteorological aspect, or the opposition to drifting wind and rain, we have spoken before. The utmost that we feel disposed to allow on this score is the precaution that the windows on this side of the house should not be too large or too numerous. Again, verandahs or sun-blinds allow of the windows being left open during rain, if it is not too cold. The exquisite charm of an oriel window opening to the west, more especially if it be on a site commanding what is the most beautiful of all prospects in England, that of a westward sea, is something not to be lightly lost.

This general idea of arrangement has to be controlled by the question of the principal entrance. In the Italian palace which we have taken as an illustration, the great *portone* was on the north, in the centre of the building, and the carriages passed into the court-yard under the two drawing-rooms that we have described. Nor do we think that a better arrangement can be suggested for a large town-house in any part of Europe. But for a country-house, the matter is different. If the elevation of the site, that is to say its level with regard to the orography and geology of the vicinity, be good, it is a very great desideratum to have the reception-room on the ground-floor. Thus alone, for example, can the greenhouse be introduced as a constitutional feature of the reception-room,—except at unnecessary expense, and with a sharp limitation of the size of the plants cultivated. That important part of an English residence was wanting in the Italian palace. It was wanting there for two reasons. First, the true love of flowers is rarely to be found among the southern races. Intercourse with the higher classes of European society, and with the great world of Paris, or of London, of course tends to check, or to disguise, this want of appreciation of nature. But a positive hatred of trees is found amongst many southern people, and in many places that we could name a person adorned with a bouquet is popularly regarded as a fool. In the second place, Nature herself has provided a winter garden in the Plain of Sorrento. The days are few in the year in which a glazed conservatory would be agreeable, or even endurable. The outer world has always been taken more into association with the dwelling-house in Italy than is the case in our climate. Opposite to the *portone* of the palace we have referred to a magnolia rose to the height of a forest tree, laden in its season with superb flowers, the scent of which was so powerful that it would have been undesirable in an enclosed space. Around this perfumed shrub grew palms, scitamineæ, pepper, and other sub-tropical forms of vegetable life, the whole being set in a thick orchard of orange trees. With such a winter garden, available at any moment when it was not actually raining, it may be well conceived that a greenhouse was unnecessary.

The object that we think the designer of an English house should steadily keep in view, is first to consider how the special particulars of each aspect are suitable to the habits of those for whom he builds; and then to arrange his rooms accordingly. And this principle, if it be, as we hold, the true one, is as applicable on a small scale in a cottage, as it is on a large scale in a palace. As between a direct north, or north-east, or eastern aspect for a com, and an outlook to the contrary points of the heavens, there is a difference equal to that of the use or disuse of a fire, for perhaps four months out of the year. This consideration points to the utilisation of the north aspect, where possible, for the entrance on the ground floor, and for corridors, picture gallery, staircase, or the less important apartments of the house, on the upper floors. Special care should be given to the avoidance of the east, and next to that of the north, aspect for the nurseries, particularly the sleeping-nurseries, or for any rooms to be used in case of illness. A removal to a north room, in certain stages of convalescence, has often proved fatal to a delicate patient. Fires, even if freely used, do not compensate for the chill of a northern aspect. And what we are so slow to learn in this country,—although necessity has been the mother of invention in that respect in Italy,—is, that it is far easier to exclude from a house in England the undue heat of the summer, than it is to keep out either the boisterous wind of the north, or the biting blight of the east; or, at all events, the uncomfortable effects on temperature and on temperament which accompany these winds in our island. Whether we have seventeen rooms *en suite*, or an entrance and front and back parlour, the difference to be made by the judicious arrangement of the house with regard to aspect is not one easy to overrate.

ANOTHER WORD ON THE "QUANTITIES" QUESTION.

THE paper read by Mr. Honeyman at the Institute the other day on the subject of bills of quantities, and their relation to the contract, which was followed by a long discussion, has been the occasion of one or two letters in our columns since, and has led some other correspondents to ask why it was read at all. Its author, an able architect of large practice and experience in Glasgow, seems to have been struck with the fact that the Glasgow system of estimating for a contract differed from any other, and notably from the London system; and, penetrated with confidence in the superior business-like qualities of Scotland over England, and of Glasgow over the rest of Scotland, to have assumed, rather too hastily perhaps, that the Glasgow method must, *ipso facto*, be the best, the fairest, the most business-like, and the most economical; and, under this persuasion, he came to London to show us the error of our ways. The general talk on the subject which has been raised in connexion with the paper argues the existence of a good deal of confusion of thought and of principle in regard to this subordinate stage in the realising of an architectural work.

It is not sufficiently remembered that quantities and the quantity surveyor are not in the nature of things essential adjuncts to architectural practice, and that, in fact, the position which these now take is of quite recent date.

Mr. Honeyman, indeed, did appear to remember this at the outset of his paper, for he made the remark in so many words, that "the proprietor has nothing to do with the means which the builder may employ to ascertain the value of the work. One builder may measure the work himself, another may get some one to measure it for him; one may have it minutely measured, another may do it roughly, or even guess what the value should be. All the proprietor, or his agent, the architect, wishes, is an offer *bonâ fide* for the execution of the works he has illustrated and described." This, as Mr. Honeyman says, is "the normal relation of the parties in estimating"; and it is something to get even this admission from an architect who in his subsequent reasoning attaches such a far greater importance to quantities than seems consistent with this view of the "normal relation."

There are many architects now practising who remember very well those days of patriarchal simplicity, as we suppose we must now regard them, when each of the builders who had been invited to tender for a large piece of work took out his own quantities, or had his own man to do it, or, in some rare cases, dispensed with such reckoning altogether, and satisfied himself with the estimate which could be made with a very practised eye and clear judgment, assisted by a few necessary measurements; and the tenders so formed were often by no means the furthest from the mark; for, in fact, it is the power of estimating what work will cost which makes a successful contractor,—which made in the first instance the initial successes of our Petos and Brasseys, our Myerses and Kelks,—as well as the ability and probity to carry it out thoroughly afterwards. The contractor with special ability, and with some special means of meeting the particular work in hand, had, therefore, in the pre-quantitative era, a more distinct advantage, perhaps, in his talents than he has had since. We are not deprecating the change,—merely noting the fact that the old system may have had the advantage of being more likely to give the work to the man best capable of grappling with it. But, of course, it was inevitable that as building operations, in London especially, tended to become larger and larger, and the demand for quick returns for outlay made time so important an element in the contract, this comparatively slow, usually expensive, and very definite manner of arriving at an estimate should give place to something less troublesome and less costly. It was, in fact, the desire on the part of the contractors to economise, and to pay one surveyor to do the heavy part of the work for all, instead of each spending time or money separately in quantity-taking, which led to the existence and general recognition of the quantity-surveyor's work as a stage in the progress of the building from conception to realisation.

Concerning Mr. Honeyman's once favourite Glasgow method, it seems hardly necessary to say much. The surprise, to others (we imagine) as well as to ourselves, will have been that any can be found to recommend a system which involves double measuring, first on the drawings, and afterwards on the completed building, which keeps the specification, for all we can see, entirely out of the sight of the builders estimating (indeed, makes a specification, as *we* understand the word, almost an optional matter), and leaves the proprietor, till the completion of the building, in doubt as to the precise amount which he will have to pay, even if there is not a single alteration or addition to the original design in the course of the building. What is the advantage of this method, except to a young architect who may be stupid at specifying, and likes to turn over this irksome part of the business, essentially, to the quantity-surveyor, we utterly fail to perceive. The disadvantage to the proprietor seems too obvious to need pointing out; but we may call attention to the drawback which seems often at least to be connected with it, that the builder may not see any specification at all,—that he may estimate on a bare statement of "foot run" and cubic and square feet, and that thus the real intention of the architect in regard to the building as a whole hardly comes before him. This system must certainly operate, more even than our own in London, in putting the stupid builder on a level and on an even chance with the clever one; for the mere sight of the plans and specification must often give to a clever man a hint as to the best and most economical way of executing the work shown and described, which could not possibly be derived from the tabulation of measurements in a schedule. The advantage of saving 10 to 15 per cent. usually charged for contingencies is an advantage only where the contractors are in the habit of charging for contingencies at that rate, as it would seem that they are in Glasgow, so that the saving is effected by not paying that which need never have been charged at all (for certainly London builders do not include a percentage to that extent for contingencies), and thus the advantage to the proprietor seems an imaginary or abitrary one at the best, more than compensated for by the uncertainty in regard to the amount which he will really have to pay. The result of putting the specification in so entirely subordinate a place seems to us likely to be (as Mr. Honeyman in part admits that it is) very injurious to the younger members of the profession and their clients, as they are thus enabled to evade one of the most important responsibilities of professional work, without going through which no man can really be sure that he understands his own building, and all that he contemplates in it. Indeed, as there has been some talk recently about references to building in Shakspeare, we might add one more to the quotations to be found in the *Builder* for June 7th, and suggest that Shakspeare had stated in advance the correct view of the position which the architect might in some cases assume under the Glasgow system, and of the feelings of the proprietor and contractor, when he wrote the words,—

> "What's here? A portrait of a blinking idiot,
> *Presenting me a schedule.*"

To come to the London practice, we have now the cumbersome system of a knot of builders working separately to get at the same result, superseded by a system which either appoints one surveyor to do this work for them all, or, in works of large extent, and where large sums are at stake, two surveyors, named one by the architect on the part of the proprietor, who shall see that the quantities are not taken too full for the interests of the latter; the other named by the contractors to see that their interests are fully considered, and that quantities are not taken too short for their interest in making a remunerative job of the work; but, in fact, working jointly and as the agents of the contractors. The theory of the matter is this: the builders wish to have the quantities taken for them by a surveyor, as a method more economical of time and money than the old system of separate measuring by each contractor. On the supposition that all quantity surveyors were, what most of them are, men of the highest and strictest probity and tried ability, here would be an end of the matter. Human nature, however, being notoriously imperfect, it occurs to the architect that there is not here the same check on over-measuring which competition necessarily produced when each contractor measured for himself; that the surveyor employed by the builders might be capable of measuring high so as to bring on him no responsibility, such a result being also in favour of the contractors. It is the interest of both to have high measure in the quantities, and the architect says on behalf of the proprietor, "I must either have a voice in the selection of the surveyor, or there must be a second surveyor named by myself to take them conjointly, as a safeguard to the interests of my client." Does the architect thereby make himself responsible for the quantities? Mr. Honeyman says yes, and that he ought to accept the responsibility on the part of the client and make the quantities part of the contract. In practice, however, it is nothing of the kind. When the contractors have accepted a certain quantity surveyor, either as named by the architect or agreed upon jointly by themselves, the question of correctness in the quantities then rests between them and the quantity surveyor; they agree that his charge shall be paid out of the first instalment received, and for any serious errors in the quantities which might by possibility be discovered afterwards he would be liable to the contractor and not to the architect, or proprietor. Mr. Honeyman seems to think that, this being the case, the interference of the architect at all is illogical; that it goes either too far or not far enough; that there can be no reason for his interference unless he also makes himself responsible. But the quantity surveyor is in a different position in the matter; he is not necessarily supposed to be bound by the same sense of responsibility and the same code of honour as a professional adviser; he is not (theoretically) supposed, like the professional adviser, to put his client's interests before his own. It would be possible, no doubt, for the architect to enter into collusion with the contractor to raise the cost of a building in order to augment his own commission; and just as there are possibly quantity surveyors who would play into the hands of the contractor as to the quantities, so there may be, here and there, persons bearing the professional title of architect who would play into the hands of the contractor in regard to the estimates and the commission. But the theory, and, as a rule, the fact, of the position of a professional man is that he is by social and professional status placed above the temptation to such iniquitous courses; that the architect is to be trusted to do the best for his client's interests, just as a solicitor is to be trusted to do so, though his own interest might and often does lie in the opposite direction of the advice which he would give to his client. Many considerations have led to the general acceptance by society of the understanding that a professional adviser is by etiquette supposed to be, by his status and professional code of honour, above the temptation to consider any but the true interests of the client who seeks his services. If this were not understood and acted upon, there would be an end of the employment of most of the learned professions, and of the confidence placed in them. There may be no reason in the nature of things why the same confidence should not be placed in those who follow vocations that are not regarded as "professions," or as conferring the same social status as those who pursue them; but there remains the fact that society does not at present take that view.

In cases where an architect supplies quantities himself openly and professedly, he is, of course, bound to guarantee their correctness, and to hold himself responsible to the contractor. The theory about giving the contractor "opportunity to check the quantities," by way of shuffling off the responsibility for them, is untenable; any checking that would be of use to that end would really mean taking the quantities over again. But for this very reason we object entirely to the architect in any case furnishing the quantities, which is only putting himself doubly in a false position; recognising the quantities, which are, in fact, no business of his, and making himself the servant of the contractor; whereas the real and honourable position of the architect, in all matters where both client and contractor are concerned, is, to a considerable extent, that of an arbitrator between the two, doing justice to both. The establishment of a profession of certified surveyors has been suggested, recognised by the Institute, and who would have an ascertained status in every respect, which would put their quantities above suspicion; and this may be worth considering. It seems to be one result of the prominence given to quantities now that some quantity surveyors seem to think they are much more important people than architects, or at least that taking out quantities is just the same thing as architecture. They would, on consideration, see that this is not the case. As Mr. Justice Denman said, in a passage quoted by Mr. Honeyman, "an architect cannot be regarded as a mere caster-up of figures," and though it is not very often that we hear anything very reasonable concerning architects or architecture from the judicial bench, in this matter it seems the Court is with us, and we are certainly with the Court. An architect may be, and, indeed, ought to be, a capable quantity surveyor, but a capable quantity surveyor is not necessarily an architect.

J. B. PAPWORTH.

IT is a subject of no small interest to those who are connected with the architectural profession in the present day to go through some of the records of the earlier and less prosperous phase which preceded the rise of the general interest in architecture, and of what may certainly be called, in comparison, the prosperous circumstances of the architectural profession as now existing. It is true that, as we have reason continually to complain, the subject of architecture is not really "understanded of the people" even now, and its professors have a good deal to complain of frequently in regard to misunderstanding and unjust and mistaken criticism. Yet if we compare the present day with any records of the state of things in the latter part of the last and the early part of the present century, we certainly become conscious of a vast change in our favour. Building of the

kind which is called architecture,—building, that is to say, with a more or less artistic purpose,—is now carried on to an extent and at an expenditure which may fairly be called enormous when we contrast it with the record of what was done, and the way in which it was done, but two or three generations since. Nor are the changes since that time merely interesting from this point of view. The difference between the views as to what is to be expected of an architect, the objects at which he should aim, the method of study, in the present as compared with the past, are so great that we seem to be going into another world of experience entirely in reading the memoirs of any one of the men who practised the profession with success in the earlier part of the century. Memoirs of such men are, therefore, useful and interesting contributions to architectural history; they assist in bringing before us a clearer idea of what has been done, and of the direction in which things are tending; and it is desirable that those who have the materials for such records should secure them before they pass entirely into oblivion.

This is the kind of interest which belongs to the small book in which Mr. Wyatt Papworth, with the assistance of one or two friends, has given some account of the professional life of his father, the late Mr. J. B. Papworth.* The book is printed for private circulation: if this restricted form of publication was adopted merely on grounds of good taste, and with the idea that the book could not be of public interest, we should say there is room to doubt the necessity of adopting this view: the architects themselves make now a public sufficiently large to be worth appealing to; but a large number of our readers will probably have seen the book, or, if not, will be interested to hear something about it.

The family of the Papworths have been connected with architecture or building for three generations,—a kind of descent of profession from one generation of the family to another, which was common about the last century. The first member of the family mentioned in the book was a grandfather of Mr. J. B. Papworth, who came from the native place of the family in Huntingdonshire to Westminster; and his son John Papworth, born in 1750, was apprenticed to one of the leading men in the stucco-and-plaster trade or art, whichever the reader likes to call it, then no doubt a more flourishing and more respected form of artistic workmanship than it is now considered, when so much disrepute has been thrown on materials of that kind from the architect's point of view. John Papworth became known as "architect, plasterer, and builder," and had 500 men at work under him, designing a great deal of ornament for Sir W. Chambers's buildings; and, considering the importance attached to plaster in those days, and that most of the best ornament of the best interiors was executed in that material, his work must have formed no bad school for an architect in those classic days. His eldest son Thomas carried on the business; two others became architects, George, who settled in Ireland, and had an extensive practice there, and John, the subject of the present book, who, in a fit of enthusiasm for Michelangelo, subsequently added the patronymic of that great artist to his name, and became known as John Buonarotti Papworth.

Like so many men who have attained eminence as architects in their day, he was the pupil of a man of no reputation, at least now, for the name of Plaw is quite forgotten, though he was recommended as a master by no less a person than Sir W. Chambers. The author gives a list of the books which seem to have constituted his father's architectural library at starting in life; it is a very short one, including Chambers's "Decorative Part of Civil Architecture," and Batty Langley's "Gothic Architecture Improved"; Stuart and Revett, Alberti, and Nicholson, and Brook Taylor's "Perspective," completed the list. It was something to say for the advantage of the architect in those days, that he could at least start on his career with a much smaller stock-in-trade, as far as the artistic side of the profession is concerned, than he can at all afford to be content with now; on the other hand, a very much less degree of practical knowledge in regard to construction and materials is made to "do" now, by many an architect of large success, than would have been thought necessary in John Papworth's generation. A very brief autobiographical sketch, the commencement of what was never completed, follows the account of Papworth's earlier life, and gives an account of the circumstance which led to his being brought up to the architectural profession. "At the little theatre in the Haymarket" (which may be seen among Mr. Crace's collection of views of Old London before mentioned in our columns) "there was at that time, 1787, a drop-scene, painted by Michelangelo Rooker, of a Corinthian colonnade and court of a palace. It was very much admired then, and maintained its reputation as long as the theatre existed. It was the first time of his visiting a theatre, and this scene greatly delighted him. As it was the school vacation, he drew it on the next day, and as he was finishing it, Mr. Wilton, sculptor, came in, and was so pleased with it that he took it to Sir W. Chambers; and on the following day he took the boy and all his drawings to Sir William, who was then living in Berners-street." It may be remembered by those who have read Mr. Ferrey's Life of Pugin, that Pugin's first efforts were connected also with theatrical scenes and models. Papworth adds, that he had been in the habit of drawing "the orders" from six years old, but confesses that he thought he adopted a style of drawing that could be accomplished with rule and compasses, in order to avoid unfavourable competition with his brother Thomas, who was then a good sketcher in a free style. There have been not a few architects of older years about whose drawings the same might be said. At the age of fifteen, however, he had acquired much more extended power of drawing and designing, and subsequently owed a good deal to the study of the work done by Sherringham, who had brought over various French decorative artists to carry out the work at Carlton House. His first client, with whom he seems to have been always on terms of great friendship also, was Sir James Wright, with whom he appears to have lived while superintending the erection of a house for his client's son in Essex. He came to town occasionally to attend the Royal Academy, his professed object being to carry his knowledge of perspective further, and it is worth notice that the then Professor of Perspective told him that "the Academy did not profess to enter on the elaborate branches of the subject." It is possible the Academy professor was more in the right than Papworth seems to have thought. Perspective, beyond a certain point, becomes more a matter of science than art.

Like a good many architects of the last and previous generations in this country, Papworth was literary in his tastes, though his first book was strictly and practically professional, being a treatise on "Dry Rot in Buildings"; but he subsequently showed considerable facility in verse-writing (we know not whether we may say poetry), and wrote also a prose story, to accompany a collection of plates by a Viennese artist,—rather an inversion of the usual order of things. He also wrote the descriptions to the plates illustrative of buildings and squares in London, in Ackermann's monthly review called the "Repository of Arts, Literature, Commerce, Manufactures, Fashion, and Politics," a title in itself suggestive of the period when it appeared; a publication claiming to deal with such a list of subjects would never have a chance of being believed in now. Papworth appears also to have had considerable ability as a water-colour artist, and to have made good use of it in drawings which were exhibited at the Academy and elsewhere. The variety of designs to which he turned his attention is illustrated in the list of designs he contributed to Ackermann's "Repository" aforesaid, in a series of papers called "Architectural Hints," including "a cottage ornée, a Gothic hall, a vestibule and staircase, plans of St. Paul's Cathedral and Westminster Abbey, relative to a criticism on their respective merits; a conservatory, a Gothic State bed, a Gothic library, a chimney-piece and grate, footstools, French curtains;" and his connexion with one of his best clients arose out of designs for pocket-handkerchief patterns; and another client, a Mr. Galloway, an engineer, came to him to design the figure-head for the first steamboat, *The Engineer*, which floated on the Thames.*

His connexion with his most distinguished client, the King of Wurtemberg, arose through the secretary of the king's *chargé d'affaires* in London, through whom he was commissioned first to make plans to carry out "an intention to Anglicise some of the royal domains," and subsequently to design various palaces for the domain, the drawings of which, exhibited in the Academy, excited much admiration, of which a letter of Lord Elgin's, which is printed, gives marked testimony. At the same time he seems to have equally succeeded in pleasing other clients with such things as shop-fronts, one of which, for Messrs. Turner & Clarkson, in Coventry-street, attracted so much attention from customers that they constantly asked "who put up your front?" and always, of course, got the name of the *builder* in reply. Another work which was considered nearly unique in its day was the Rotunda building at Cheltenham; and when the art section of the Social Science Congress met in that room last year, and sundry subjects connected with architecture were discussed, perhaps no one was aware that a name so well known in the profession as that of Papworth still is, was connected with the room of meeting. In justice to the architect, it should be added that the large room was designed simply as a promenade and pump-room, not as a room for speaking in, a fact which those who tried to speak and hear in it found out painfully on that occasion.

Among Papworth's more important literary labours in connexion with architecture may be mentioned his "Essay on the Principles of Design in Architecture, with nine new plates, illustrative of Grecian Architecture," prefixed to the fourth edition of Sir W. Chambers's "Civil Architecture," published in 1826. This is a very able essay, admirable in its literary style, and showing far more freedom from conventional and pedantic taste and criticism than was usual in his day. His lighter literary sketches seem to have been very numerous, and a pleasant idea is given of his gaiety and humour as a correspondent in the letter printed in full (p. 63), in reply to a request from the Rev. G. Croly as to the real meaning of an allegorical design of Papworth's for one of Ackermann's publications, for which Croly had undertaken to write some lines.* Parts of his journal and letters from the Continent are very graphic and interesting, and show the observation of a thoughtful and lively mind. We are interested, also, in his opinions upon architectural competitions, which were then coming into vogue, and in which there was not then, apparently, the pretext of impersonality and anonymity which is now kept up, though in too many cases little more than a pretext. His remarks struck us as coming singularly apropos to some comments we thought it right to make only a week or two back, concerning a phase in the life of a more distinguished architect, and it appears that Mr. Papworth was of much the same mind as ourselves on the subject. Having visited Oxford about the business of the competition for Carfax Church, and having, according to the then custom, exhibited his drawings to a committee, as did also the other competitors, he says in a letter home, "You will believe me when I say that this sort of vagrant begging for business and soliciting 'the dirty voices of the scoundrel multitude' is very offensive to me. I really hate it, and have once or twice been disposed to cut the matter very short, and leave it in the hands of the Fates, who, by the bye, are not very indulgent to those who have not the impudent intrepidity to direct or strive to govern them. In a few words, I think this sort of competition is very blackguard work. I am angry at it, even with good chance of success." That appears to us to be the feeling with which every one who wishes to preserve entirely the standing and associations of a gentleman must regard such experiences, and we only wish there were more architects nowadays of Papworth's mind than, we fear, there are. Too often the rule seems to be, "succeed in a competition,—honestly if you can, but succeed anyhow."

The whole of the record of J. B. Papworth impresses us with a great liking and respect for its subject. He has not left his name attached to any great work, and he lived, though he did not perhaps know it himself, at a peculiarly unfortunate time for architects and architecture,

* John B. Papworth, Architect to the King of Wurtemberg: a brief Record of his Life and Works, being a Contribution to the History of Art and of Architecture during the period 1775–1847. By Wyatt Papworth (privately printed). London. 1879.

* The figure-head was a figure of Science inscribing a problem of Euclid on a tablet. Other ornaments and emblems in the vessel were designed by him also.

* The Rev. G. Croly, here mentioned, it may be observed, was a "great living poet" of his day, and was considered by his friends to have proved himself a successful rival to Byron, in a purer and more moral style!

and certainly shared the weakness of taste of his own day more or less, and the style of design to which he gave himself is necessarily a thing of the past. But he filled a considerable part in that chapter of the history of English taste, and filled it well and honourably, and we have to thank his son for putting together this interesting memoir of a man who deserved to be remembered with esteem.

THE EMPTINESS OF PICTURE GALLERIES.

A SLIGHTLY cynical story is narrated of one of the authors of the "Rejected Addresses," who, on his being asked to meet an artist at dinner, replied that he did not care to do so as he could not talk art, and artists could talk of nothing else; but we fancy now-a-days, at all events, artists are not more "shoppy" than other men, or their conversation on the whole more wearisome than the ordinary run of people one meets either in Belgravia or Tyburnia. South Kensington, of course, is an exceptional quarter, and just now seems rather to have the advantage of its neighbours in artistic popularity.

In the months of May and June, at all events, poor Mr. James or Horace Smith, if they happily were living in the present day, would be sadly put to it to hold his own in conversation without some slight acquaintance at least with the painful subject of art; and they would very soon find that they need know very little about the subject and yet appear to talk exceedingly well; a taste for pictorial art being, after all, no more, as Hawthorne says, than a polish upon the hard enamel of an artificial character.

Nevertheless, at this season of the year, paradoxical as it may seem, there is to some of us an emptiness in our many picture-galleries which make the Royal Academy or the Grosvenor about the only spots in gay London where one can conveniently indulge in the luxury of melancholy contemplation; for of all places the "icy demon of weariness seems most to haunt great picture-galleries, such as these" and their smaller rivals.

With this demon at our elbow we many of us enter picture-galleries, to find cold, colourless canvases, without sentiment or without passion; we find ourselves seeking amusement in realistic representations of still life and easy brush-work or the fascinating charms of "texture" and execution.

The Royal Academicians were artful in devising an addition of a refreshment-room to their picture-galleries, and Sir Coutts Lindsay made a wise and noble fight for his licensed-victualler rights; for the hungry man, and still more the hungry critic, is in no state of mind to form a correct opinion of a picture, which, however admirable, requires of the spectator a "surrender of himself in due proportion with the miracle which has been wrought."

Let a canvas glow as it may, we must be believers in the painters' art, our faith must be firm, or we see little beyond shadows, feeble lights, paint, and varnish; but after a good luncheon it becomes easier to help out the artists' meaning with our own vast resources of sensibility and imagination. There are few enjoyments that require a more congenial mood for their utmost fulfilment than the enjoyment we seek from seeing pictures, nor can painters be expected to comfort the heart in affliction; nature, books, and music will do so, but pictures, never; the heart grows dead when the shadow is upon us.

Pictures of a joyful description, like comic literature, are very often melancholy aids to hilarity, and pictures representing scenes of the warmest sentiment and pathos, rarely raise the spirits beyond the desire to smile, and in such a state of mind one is apt to doubt whether the pictorial art be not altogether a delusion.

The faculty of appreciating works of art is not awarded to every one, and the mass who eagerly throng to picture-shows are invariably more pleased with those pictures that are least deserving to be regarded as meritorious.

The majority of people who visit picture-galleries are much less critical than cold, and care as little for adding sympathetically to the artist's creation by any strength of their own as they do for the different effect the picture would have upon them at some other moment, or when they are in a different mood. We do not often approach pictures with what has been called "a sufficient gifted simplicity of vision" to allow of our adequately appreciating the revelations that the artist has more or less successfully placed before us, and we turn away carelessly from long and very often well-considered work, or just as often stop and hastily attempt to criticise severely a picture which, with a little more sincere reflection, we might learn to admire or to condemn.

If our picture-galleries were less filled with pictures, and at the same time more crowded with thought, the complaint of the emptiness of picture-galleries would involve many more interesting considerations than the idler is disposed to indulge in at the Royal Academy or the Grosvenor.

As long as we visit our picture-galleries simply to be amused, there will ever be an emptiness about our collections that will torment those who seek to enjoy pictures in an uncongenial mood. Every haunter of picture-galleries, we should imagine, must have experienced the feeling in a greater or less degree; and, to judge by the amusing remarks that some of our acquaintances make after a visit to the Royal Academy, we sincerely believe that a very small minority, in seeing picture-galleries, take real pleasure that has any abiding influence.

The *dilettante* character of the Grosvenor is eminently qualified to afford its visitors the instructive advantage of analysis; and, by attending well to its teaching, a true knowledge of the æsthetic is to be obtained.

The artist and the connoisseur here meet on tolerably equal footing, and the mere passive observer who has visited the Grosvenor leaves the gallery with some addition at least to his stock of beautiful recollections.

After all, a picture gallery that appears to us empty at one moment, may be full of instructive matter and pleasure at another, and it is in our own power to fill the gallery with noble or with degrading thoughts.

There are moments when we are disposed to condemn everything, when some one is always in our way, and perpetually doing wrong to annoy us, and at such times we see in pictures nothing but paint and emptiness, and perhaps we at such moments may not be altogether wrong in thinking that one picture in ten thousand, perhaps, ought to live in the applause of mankind from generation to generation, until the colours fade and blacken out of sight, or the canvas rot entirely away. For the rest, again we quote from Hawthorne, let them be piled away in garrets, just as the tolerable poets are shelved when their little day is over: is a painter more sacred than a poet?

FROM THE BANKS OF THE SEINE.

IN the professional world the event of last week may be considered the meeting of the seventh session of the Architectural Congress, the programme of the papers read at which offered certainly an interest more than usual. On the 16th inst. the Congress, under the patronage of the Société Centrale de l'Architecture, held its opening meeting in the hemicycle of the École des Beaux-Arts, the hemicycle which the name of Delaroche has quite as much rendered famous as those of the many laureates who have been crowned there. The committee formed, under the presidency of M. Jolly, after a few words of congratulation M. Paul Sedille read an interesting notice on "The Life and Works of M. Duc," in which were recalled the numerous undertakings of the late eminent architect, to whom Paris owes the restoration of the Palais de Justice,* and so many other important works. M. Gaston Henard also submitted to the Congress an interesting study on the architect's diploma. On Tuesday morning, as had been announced, a visit was made to the Municipal School of the apprentices of the City (of Paris). Later on in the day M. Achille Lucas presented a valuable paper on Architecture at the *Salon* of 1879. Wednesday was occupied with the discussion of the important question of artistic property in architectural works. Thursday was employed in visiting the National Manufactory and Ceramic School at Sèvres. On Friday, M. Charles Lucas, the energetic secretary, presented an interesting summary of the latest archæological discoveries made by the École de France, at Athens. On the last day of the Congress, Saturday, after a morning visit to the College Chaptal, the medals awarded by the Société Centrale des Architectes were distributed, under the presidency of M. Turquet, Under-Secretary of State to the Ministry of Fine Arts; for domestic architecture, the École de France at Athens; the École des Beaux-Arts; the École des Arts Décoratifs; the private schools of architecture; the schools of apprentices, two foremen respectively gaining the silver and bronze medals; the various workmen employed in the building trade,—a dresser obtaining the silver medal, and a mason the bronze medal;—and finally, the art industries connected with architecture, the silver medal being awarded to an ornamental sculptor. By M. Ravaisson, member of the Academy of Belles Lettres and Inscriptions, and curator of the Musée des Antiques, a valuable address was delivered on the teaching of drawing. With a dinner at the Grand Hôtel, the seventh meeting of the Architectural Congress was closed. It is unfortunate that the amicable spirit of this yearly gathering should have been somewhat injured by the want of unanimity that exists in the Paris architectural world with regard to this "so pompously designated," we learn from the *Architecte* (the organ of the National Society of French Architects), "Architectural Congress." The excellent chronicler of that journal complains of the apparent neglect on the part of the organisers of this yearly meeting to recognise the existence of a crowd of societies of French architects, not alone in France, but abroad. In fact, calling this meeting a congress, he urges, is altogether a misnomer.

On Saturday last the celebration of the fiftieth anniversary of the foundation of the École Centrale des Arts et Manufactures collected in the large hall of the Trocadéro (one of the architects of which, by the way, M. Bourdais, was a pupil of this school) a large crowd of invited guests. The meeting was presided over by the Minister of Agriculture and Commerce, at whose side sat the veteran M. Dumas, the last-surviving founder of the school, surrounded by numerous representatives of foreign nations. Among these latter, not least conspicuous by their striking costume, were the recently-arrived Chinese Commissioners. The pupils and former pupils of the school occupied, in large numbers, the spacious pit, and loudly applauded the interesting, even if somewhat lengthy, addresses, recounting the history and progress of the institution. In the evening a concert and ball, at the Hôtel Continental, further marked the "golden wedding of the École Centrale."

It is a French axiom which would seem to possess no small degree of truth, that "*Quand le bâtiment va, tout va*,"—when the building trade is prosperous everything is prosperous. From the humblest mortar-mixer to the upholsterer putting the last finishing touches to the completed home, there reigns at present in the building trade and its accessories, an activity resembling strikingly that noticeable in England. Since the 15th of last month, we learn from recently-published statistics, more than eighty new houses have been commenced. In one neighbourhood of Paris alone, that of the beautiful Parc Monceaux, it is impossible not to be struck with the immense employment given to the building trade, and more especially in its more ornamental branches, the work produced by which, however, notwithstanding this patronage, we regret to have to say can scarcely claim as formerly the approbation of the fastidious artist. Even under the Empire, when the whole of Paris seemed enveloped in scaffolding, and the Government more than once expressed its pride at having brought to such a position so important a branch of industry, the activity of the building trade was scarcely equal to that at present reigning. The following figures, the responsibility of which must rest with the *République Française*, will serve to show the effect of the somewhat more constitutional, even if smaller, encouragement afforded at present by the City of Paris. In 1867, the culminating point of Hausmannism, the year of the Great Exhibition, 120 millions of kilogrammes of lime and cement, very nearly 120,000 tons, were employed. In that year, and during the three preceding years, the City had expended more than 900 millions of francs (36 millions sterling). To obtain this sum, against all precedent, the signature of the City had been surreptitiously negotiated, and false communal bonds issued to the amount of nearly 19 millions sterling. In 1877, on the contrary, the City of Paris, thanks to an honest and modest loan of 120 millions of francs (nearly five millions sterling), has revived

* See *Builder*, vol. xxxvi., p. 243.

the important building interest. About 101 millions of kilogrammes of lime and cement (about 101,000 tons) have paid town dues. Last year, the Avenue de l'Opéra having been built, and the action of the city reduced to a minimum, the entry diminished to some 80 millions of kilogrammes (about 80,000 tons). In 1869, the City of Paris expended nearly 6 millions sterling in its buildings, and the amount of material employed was about 94,000 tons. During the three first months of the present year, a quarter of this sum has been reached with an almost imperceptible intervention on the part of the City, and alone the result of the activity and vitality of private industry, the symptoms of a prosperity which, if more economical, is at least somewhat more durable than that of the ast government.

THE CITY OF LONDON SCHOOL.

THE City of London School was established in the year 1834 under a special Act of Parliament, and is endowed with an annual sum of 900*l.* out of a fund bequeathed to the Corporation in 1442 by John Carpenter, Town Clerk of London in the reign of Henry V., for the purpose, as his will expresses, of "finding and bringing up of four poor men's children, with meat, drink, apparel, learning at the schools, in the universities, &c., until they be preferred, and then others in their places, for ever." This same John Carpenter also "caused with great expense to be curiously painted upon board about the north cloister of Paul's, a monument of Death leading all estates, with the speeches of Death and answers of every state." This as, no doubt, a *Danse Macabre*, or *Todtentanz*, a very popular representation in the Middle Ages, with which we are familiar through the engravings of Holbein and others.

The school fees for each pupil are now 10*l.* 10s. a year, the original charge having been 6*l.* 15s. The general course of instruction includes the English, French, German, Latin, and Greek languages, writing, arithmetic, mathematics, geography, history, and natural science. There are several valuable scholarships attached to the school, among which may be mentioned two exhibitions founded by Sir William Tite of 25*l.* and 20*l.* each.

The school, which is situate in Milk-street, Cheapside, was built from the designs of the late Mr. J. B. Bunning (before his appointment as City Architect), on the site of Honey-lane Market, the first stone of the building having been laid by Lord Brougham on the 21st of October, 1835.

The position of the school is very confined, and the site quite inadequate for modern requirements, the superficial area occupied by the building being only about 9,000 square feet. There are no playgrounds; no sufficient provision for natural science teaching, a branch of education which was almost unknown at the time the school was founded; no luncheon-rooms, and the general arrangements of the school and administrative departments are much below the standard now considered necessary in primary schools. It need scarcely be remarked that the system of tuition in public schools has undergone considerable modification within the last few years, and that a building erected more than forty years ago must of necessity be deficient in many important particulars now considered essential to a school.

From its position it is impossible to extend the present school, the site of which, although unsuitable for educational purposes, has considerably increased in value of late years, and is well adapted for warehouse purposes, being in the midst of the Manchester market; and these considerations being pressed upon the Corporation, the whole question was referred to the School Committee.

After considerable deliberation it was resolved by the Corporation to remove the school from its present site, and to rebuild it upon a site facing the eastern end of the Victoria Embankment, adjoining De Keyser's Royal Hotel. This site is very suitable for the purpose intended, being open upon three sides; the Corporation proposing, for the purpose of developing the ground for building, to construct a street from Tudor-street to the Embankment, together with a cross street running nearly east and west to the north of the school. The site has the disadvantage of being wholly of made ground, which will necessitate the foundations of the building to be erected being carried to a depth of from 20 ft. to 30 ft. below the level of the Embankment. This must, of course, very considerably increase the cost of the proposed building. The Metropolitan District Railway runs under a portion of the site, which is also overlooked on the eastern side by the windows of De Keyser's Royal Hotel. The area of the new site is about 35,000 square feet, or about four times the area of the present site.

On October 3rd, 1878, a report, prepared by the School Committee, consisting of about thirty-six members, who are entrusted with the management of the school, was presented to the Court of Common Council, detailing the steps they had taken for the purpose of carrying out the resolution of the Court for the proposed removal of the school. They reported that they had inspected the site and the new school of the Merchant Taylors' Company at Charterhouse, and Dulwich College School, but had not considered it necessary to inspect any schools at a distance from the metropolis. The value of the new site, which contains about one acre, they estimated, on the authority of the City architect, to be about 75,000*l.* The cost of the necessary buildings for the new school the committee estimated at 50,000*l.* They had then proceeded to instruct the Architect to prepare plans for a school to accommodate 680 boys, together with a residence for the secretary, at a cost not exceeding 50,000*l.* TheArchitect accordingly prepared two designs, the accommodation in each being very nearly the same, but the disposition somewhat varied, for a building with a large hall, library, and teaching accommodation for 680 boys, which designs are illustrated in the appendix to the report. The general arrangement of the plan may be described as a central internal quadrangle, with a corridor on each side connecting the various departments. In one design the hall is proposed to be placed at the south-west angle of the site, and in the other on the axis of the building, next the Embankment. The Architect, in the report to the committee accompanying his design, estimated the cost of the building only, exclusive of the site, at 100,000*l.*, or about 147*l.* per head. The average cost of the buildings erected by the School Board for London, according to Mr. Robson, is 11*l.* per head.

The Corporation do not appear to have been satisfied with the designs submitted by the School Committee, or they were alarmed at the amount of the estimate; at any rate, the plans were not adopted, and on the 5th of February last the Corporation advertised for designs for a school for 680 boys, without a secretary's residence, upon substantially the same site as that for which designs were prepared by the City architect.

The instructions to architects issued by the School Committee are very carefully drawn, and the requirements are stated with considerable detail and precision. The accommodation required includes 20 class-rooms, each to hold a maximum of 40 boys, with coat-rooms attached, the cubic allowance of air to each boy being a minimum of 140 cubic feet; a hall to hold about 1,000 persons, exclusive of those accommodated in the galleries; a dining-hall for 200 boys, with kitchen over; a lecture-hall for natural science, for 400 boys, with laboratory, apparatus-room, and chemical class-room; playground, with covered playground for gymnasium, &c., library, committee-room, masters' rooms, secretary's office, porters' rooms, &c.

The Corporation proposed to award three premiums of 300*l.*, 200*l.*, and 100*l.* respectively to the authors of the three designs to be selected by them, such designs to become the property of the Corporation, but in the event of the Corporation employing the author of any one of the selected designs as architect the premium would merge into and become part of his commission.

The School Committee announced their intention "to recommend to the Corporation to employ as architect the author of one of the three selected designs, subject to his producing satisfactory evidence of his experience and capacity; but they do not bind themselves to do so, nor to carry into execution any design selected."

In response to their invitation, the Corporation received seventy sets of plans from fifty-three persons, the last day for sending in being the 29th of March last. The drawings were hung in an empty warehouse in Aldermanbury, to which the public was refused admission; and a sub-committee, consisting of about eighteen members, was appointed by the School Committee from among their number to adjudicate upon the designs.

In the meantime, the Corporation had prepared and brought in a private Act of Parliament for the purpose of enabling them to remove the school from its present site to the proposed site upon the Victoria Embankment. The Bill was first introduced in the House of Lords, and passed through that House as an unopposed measure. In the House of Commons, the Charity Commissioners presented a petition against the Bill, for the purpose of obtaining a *locus standi*, and the Bill was in consequence referred to a Select Committee. After hearing the evidence of Mr. Robert Vigers (who was called by the promoters as to the value of the site), Mr. Felton, the chairman of the School Committee, and the Rev. Dr. Abbott, the headmaster, the Charity Commissioners withdrew their opposition, and the Bill passed through Committee.

On the 4th June last, the School Committee reported to the Court of Common Council that they had selected three designs, which they had placed in the following order (the authors' names were not announced, but they are now universally spoken of, and the authorship assigned has not been contradicted), viz.:—

1. "Live and Learn"... Messrs. Davis & Emanuel.
2. "Simplicity" ..... Mr. Thos. Chatfeild Clarke.
3. "Playgrounds" ..... Mr. T. E. Knightley.

As is commonly the case with regard to competitions, much dissatisfaction is felt at the recommendation of the Committee, and complaints have been made of the manner in which the Committee have conducted the inquiry, it being alleged that they have not availed themselves of professional assistance, and the refusal to permit the public to inspect the drawings has been much commented upon. As regards the last head, this seems in a fair way to be remedied, Mr. H. Lowman Taylor having given notice of his intention to move that the several designs be placed in the Guildhall, or some other suitable spot, for the inspection of the members of the Corporation and the general public, previously to the report of the City School Committee being considered by the Court of Common Council. If this is done it will probably do much to allay the irritation which is naturally felt by some competitors, and will dissipate the accusations of unfair preference on the part of the Committee, and of canvassing on the part of competitors which have been freely made.

There are rumours afloat that a party in the Corporation who are opposed to the removal of the school will resist the school being rebuilt, and the plans will therefore become useless, or, if the plans are carried out, that the successful competitor will not be employed, and that the drawings will be handed over to the City Architect to prepare a fresh design.

It is to be hoped that a powerful and wealthy body like the Corporation of London will not pursue such an indefensible and objectionable course.

It is not, perhaps, too high an estimate to put the money actually expended upon each design as 70*l.* upon an average. This would make the total value of the plans sent in, in round numbers, 5,000*l.*; and as the Corporation have had the advantage of the whole of these plans, they will, if they merely award the premiums without employing the author of one of the three selected designs, obtain 5,000*l.* of work for an expenditure of 600*l.*

It is not to be supposed that the competitors, many of whom are men of some eminence in their profession, would have competed at all if the premiums had been the only inducement held out to them. They were, no doubt, greatly influenced by the prospect of carrying out an important work upon one of the most prominent sites in London, and they relied upon the good faith of the Corporation and the deliberate promise in the Instructions to Architects that the School Committee would recommend the author of one of the selected designs to carry out the work.

The *City Press* of Wednesday last said:—"We are informed, on good authority, that when the report of the City of London School Committee is brought before the Court of Common Council to-morrow, an amendment will be moved with the view of setting aside the decision on the selected plans, on the ground that such decision is 'inconsistent with their intrinsic merit.'" We were unable to ascertain the result up to the time of going to press.

ENGINEERS IN INDIA.*

TRAVELLING about an Indian district is somewhat arduous for a European. A very young man, of strong constitution, rather enjoys the shifting from place to place. He need have no elaborate furniture at his head-quarters; and, after the first expense of tents, cart, and horses has been incurred, will live very cheaply with the assistance of his travelling allowance. Indeed, it only pays if he is constantly on the move; and as, in addition, he ranks by sheer sitting in the saddle as a most energetic and rising engineer, there is every inducement to move camp as each third day comes round. But, after a time, this sort of existence becomes monotonous; and since promotion means little more than leading a similar marching life throughout a larger district of country, the engineer is apt to be struck with the strangeness of the professional groove into which he has subsided. An Indian district charge of any sort, which involves a very small and uncomfortable house, situated near a native town or village, without a European within many miles, is particularly unsuitable to a family man. Families of English residents are totally unable to stand roughing and exposure to the Indian climate. Even those of the better orders of natives have to be secluded carefully in the best shelter they can afford, and travel as seldom and as comfortably as possible. So that a district engineer, who is constantly travelling, is therefore just as constantly away from his family. He loses the profits of travelling allowance, having to keep up a proper and very expensive domestic establishment, the enjoyment of which is, however, interfered with by having everlastingly to scour the country or patrol the roads. An engineer with a family has great difficulty in rendering the monthly tale of bricks. He can only earn the distinction of being an active official by absence from home, and leaving his domestic circle to amuse themselves as they best can. In the present state of India, where large works are few and far between, this must be the position of several members of the Public Works Department. It is a desirability occurring to the same extent in no other country, and has in certain cases been so intolerable that engineers have thrown up their appointments rather than continue under the disadvantage. The Public Works Department, therefore, has, barring charge of a few military stations, and one or two appointments at the Presidencies, only the posts in the secretariats to offer to those engineers so circumstanced as to require to lead what is styled a settled life. Actual engineering work, to be remunerative and least irksome, therefore, in India, demands a monastic proclivity in the case of those engaged in its superintendence. The question at once arises whether the system of the Department is in keeping with the age. That an engineer should run the gauntlet of a stigma of inefficiency or insouciance because of family ties is hardly capable of defence. Yet so long as native agency is entirely distrusted, and it is insisted upon that a European engineer must measure and pay for every work done out of public money in every British district of India, constant wearing, peripatetic movement will be the rule, and tranquil employment at home the exception, and the Department present an unequal field to its secular and regular orders of engineers. The difficulty is in part surmounted by the extensive employment of military agency in the Indian Public Works Department. What remains to be noticed forms the substance of a very old and still-continued argument. It is, What public works ought to be done by what is called the Civil as distinguished from the Public Works Department? To understand the merits of the controversy, it is necessary to reflect that till more than half this century had passed there were no civil engineers in the service of the Indian Government. That service was entirely composed of two classes of Europeans, divided off into members of the naval or military establishment, and those of the covenanted civil service. The rest of the officials in the subordinate employments were of the uncovenanted class, or mere natives. Civil authority, of course, fell to the share of the covenanted civilians, but the public works became a sphere appropriated to military engineers specially trained for the peculiar duties to be performed in the East. The civilian magistrate of a district exercises almost all the functions of an English property agent, from the fact of the State owning the fee-simple of the land. Hence civil officers have been in the habit of imitating and often partially superintending those minor works which rank as estate improvements. The border line has never been very distinct, and civilians without any acquaintance with the laws of statics or the strength of materials have attempted bridges and buildings beyond their designing powers. However, a magistrate seldom directs engineering operations personally. He gives general instructions and a grant of money to the native officials under his orders, the main part of whose regular work is collection of the revenue from the peasantry and prosecution of crimes. These underlings employ a class of master-craftsmen, who have that intuitive sense of proportion so often seen displayed by comparativly uneducated men, and which is as innate and real as the faculty of music. Their constructive ability is heightened and regulated by a practical acquaintance with the execution of work handed down from father to son. All structures for the use of the natives themselves are raised by their operative instrumentality, and it is surprising what these master artisans, whose monthly pay may be only from 12 to 20 rupees, can turn out when under effective observation. The revenue officer is known to have absolute control of funds, and no higher authority to consult except in a merely formal manner as to their application. So that his orders are implicitly carried out, and all he has to do is to ascertain that a work has actually been constructed, to pass the accounts. The revenue officials have also certain powers of exacting compulsory labour on emergencies. On the whole, for short simple roads, and for buildings to be occupied by native members of the administration, and also for small irrigation works and municipal improvements, execution through native foremen directed by the magisterial collectors of revenue, is a cheap method of construction, and amenable to scant objection. The advocates of every kind of district work being placed under a European engineer of the Public Works Department assert that, although the works may be simple, there is no check against peculation, and that the style of work and its cost are left entirely in native hands, with an uncertainty as to its quality. There is little doubt that the natives, when given discretion, do not pay labour with the same regularity as a European, and that small sums are appropriated and relatives provided with petty positions on the works. But if any one will be at the pains to reckon up the probable amount of such *laches* in a year, and place them against the cost of the establishments which would have prevented their occurrence, the difference would probably not be in favour of the change. Where civil revenue officers fail is in attempting rather heavy works with inadequate means. Flimsy edifices and threadbare bridges result, which show the want of professional training. The natives do not venture to dispute a positive order, and thus works are run up without check, in the enthusiasm of an otherwise successful tenure of office, which bring the brief approbation of the distant Board of Revenue, and disparaging comments some years afterwards, when the tents of the Provincial Governor and his secretaries on tour are next pitched in the vicinity. The remedy, of course, is that district civil officials should submit all designs for the scrutiny of a civil engineer or architect possessing local acquaintance, leaving the method of actual construction a question of economy and convenience. The Public Works Department has a totally different way of executing work to that pursued by civil district officials. Its whole organisation is on a European model, and native routine is looked at as slipshod and irregular. The engineers have a fixed staff of college-educated subordinates, very much on the plan of the French *Ponts et Chaussées*. Natives, as a rule, occupy the lowest positions, and there is nothing that a native does which is not presumed to be checked by a European, either in the field or office. The Europeans are themselves overawed by a network of returns and a watchful secretariat. It is well known that a native in the ordinary civil departments is not satisfied with the salary of his appointment, but makes it worth much more by indirect acquisitions. The mode of doing so is kept out of sight, and is often merely the exercise of influence and patronage, which was the reward of political eminence only lately in Great Britain. At any rate, ample opportunity exists in all Indian situations held by natives in the offices of legal and revenue administration for making more than their nominal stipends. So much depends upon custom, and is readily conceded by the population, that the practice can neither be inquired into nor stopped. For example, it is quite possible for a subordinate deputy to draw a travelling allowance, and yet quarter himself upon the people wherever he proceeds, and be put to no expense. But in return for this entertainment the landed classes expect to secure a friendly ear at the Revenue Office, and that their disabilities will be examined with extra care. So again the native contractors and master tradesmen who are entrusted with district works intend to supplement their periodical remuneration by an occasional windfall. But the natives in the Public Works Department, though tolerably well paid, are under such a strict watch, and render such tell-tale accounts, that they can make nothing without the fact being either guessed or known. Consequently they have to be driven to exertion, and take little or no real pride because they derive so little satisfaction from their work. They can nominate no relatives to petty charges, nor can they assume among their countrymen the importance of sole managers of public undertakings. The effect is that every arrangement has a tendency to go wrong through neglect, where the European engineer cannot be constantly present or frequently round. There are many ways in which a native member of a permanent establishment can have his own way with impunity. One of the easiest is to feign stupidity. It is exceedingly difficult to displace on such a ground men who have been trained at a Government institution. Then there is sickness, and the ability to account in the most plausible way for a scarcity of hands and dawdling progress. But very often the native subordinates, though well educated, are really defective in practical art, and quite unable to direct workmen. So that an engineer has frequently several sub-agents whom he is obliged to employ, but who may be neither competent nor attentive. It then comes to this: that if the work is a large bridge or a single line of road of moderate length, or a building which the European engineer can visit every other day, the departmental system is much more regular and efficacious than the management of the collector. But if, on the contrary, the works are of a petty description and very widely scattered, the labour of check and the physical injury to the European constitution caused by incessant exposure to a tropical sun are dearly purchased by any economy or benefit produced. That this is the case is not readily seen in the secretariats, by whose opinion Government is chiefly guided. A secretary directing public works from a desk has to secure that some person in each of the districts is responsible for whatever goes amiss. Once an engineer is placed in charge on the spot, dealing with him becomes a mechanical matter, and if anything in the shape of loss, failure, or short expenditure occurs, which he is unable very fully to explain, he is liable to be handed up to higher authority. Now a capable engineer employed upon a large work which he can go over from end to end without great fatigue and exposure, or long absence from his ordinary residence, or upon which furnished houses have been built every ten or twelve miles by the foresight of Government, can very seldom fail in explaining casual accidents or unlooked-for difficulties. But when he is made responsible for every little rut in a road and leak in a sluice over a wide district, which it would take three months to go round at the pace of ten miles a day, it is very different. When, again, small losses and instances of disrepair are treated as professional delinquencies, it becomes exceedingly difficult for an engineer to ward off censure. Some civil official has perhaps drawn an unfavourable comparison between a collector's and departmental work on return to head-quarters from a district tour, the smart of which is felt at the secretariat. The engineer has to be asked pointedly when he was last over that corduroy mile of road. If by happy accident a recent visit had been paid, some means of pacification are promptly forthcoming. In the other event, it would need much ingenuity to get the blame saddled on the right horse. So that the position of a district engineer having a number of insignificant works to look after is one of actually much greater anxiety, far more wear and tear on his physical endurance, and discomfort, than if engaged on a single important work involving

* See p. 662, *ante*.

four or five times the expenditure of money. The only safe precedure is to be constantly on the move. The impossibility of being in more than one place at a time can thus always be urged, and is an unanswerable plea, and a sufficient exculpation. The district engineer who is scarcely three or four days in the same neighbourhood, can look with tolerable complacency at occurrences which are not at all relished by another whose less frequent journeys do not furnish the grateful *alibi*. Members of the Public Works Department will be found to assert the superiority of the principle of having every work in the limits of a district in charge of a European. There are persons, again, who consider the mere fact of an educated gentleman travelling about and mixing with the natives an immense factor in the propagation of civilisation, and they would advocate the engineer moving about even if he had a mere trifle to inspect. This is curiously evidenced by the different treatment two individuals would receive in the disposal of their leisure. A sportsman might take two or three days shooting, and be thought all the better of for thus occupying his time. There would be no inquiry as to the interlude in more serious labours. But a reading man who for purposes of study had halted for the same period, would experience little appreciative encouragement. He would probably be set down as wasting time. The idea evidently is that the huntsman is coming in contact with the natives and improving them, whilst the other is merely invigorating his own mind and producing no impression on the native population. But this is a mere relic of the company's system, who governed the country on commercial principles, and of a period before railways, when comparatively few had a knowledge of the interior. At present the main reason for extending the supervision of a European over small district works is that by this means alone can the expenditure on those works most commonly done largely exceed the cost of salaries. District works have so little finish, and are designed upon such an economical scale, that it takes a considerable number to fill up an annual budget respectably. But it may be questioned if there is any absolute reason for an engineer having to undertake every class of work within a certain specific area before he becomes entitled to receive sufficient remuneration for his services, any more than that a judge should be paid so much per judicial sentence. There must at times be a lull in engineering enterprise, while an Indian district always presents some important schemes to investigate and a good deal of scope for land improvement. But to curtail an engineer's breathing-room by exercising pressure through the diary of movements and occupying his time in tedious journeyings, in order to visit works which the natives, when the point is insisted upon, are perfectly competent to manage unaided, seems to approach a misapplication of a European's peculiar powers and qualities. District charges are much more onerous in some parts of India than in others. In Bengal, the North-West provinces, and the Punjab, only the principal lines of road are metalled, the canals are in the hands of a distinct group of engineers, and on both classes of works there are small two or three roomed houses at intervals of about a dozen miles apart, which shelter the travelling engineer from the mid-day heat. The population is often as dense as 400 per square mile, and the districts are not extensive. Twenty or thirty miles take a person from the head-quarters of one district to the principal station in the next adjoining; also in the Bombay presidency the district divisions are not excessively large, and the works consist chiefly of trunk lines of road, or buildings in the forts, towns, and military stations, or marine constructions. It is as the south is reached that the change in the system of collecting the land revenue makes itself felt in a minute interference with almost every acre of the country on the part of the Public Works as well as other agencies of Government. The population dwindles down to 200 per square mile, and the traveller may go 100 miles without coming across a residential community of Europeans. Except on the military roads there is no accommodation provided for an inspecting engineer, the Madras Government, even on the important irrigation canals, grudging the small expense that would be required to erect the houses which, are the foremost items of construction in a work of any magnitude in the North of India. Obviously, to leave Europeans, as a rule, and from year's end to year's end, to locate themselves during the hot and rainy seasons in tents which are, except for very temporary occasions, inadequate shelter, or in flimsy mud-huts they subscribe for, little bigger than tool-sheds, is uneconomical. It prevents them using their best faculties, feeling they have a full command of the country, or preserving undiminished health. Few professional men in Great Britain can imagine what it is to be encamped in the hot weather, directing a public work from a tent. The mornings and nights are endurable enough; but the hot, dry winds and dust of the middle of the day evoke such uncomfortable sensations that enforced repose under blankets is the most suitable manner of spending the greater portion of the hours of midday. The high temperature, coupled with the electric tension of the outdoor air of an Indian midsummer, cause such an oppression as almost to stifle thought and render any clear exercise of the head and hands of the engineer a laboured and forced performance. In a shaded and moistened apartment, however, the conditions are materially altered, and an individual can do a fair amount of work, compared to that of the brief waking periods under canvas. During the cold season, which lasts for half the year in Northern India, tents are very agreeable, and their use is indispensable on cross-country trips of any length and when breaking fresh ground. But they are cumbrous to move about, and ill-suited to hilly or roadless districts. In the Madras Presidency, where it is nearly always hot weather, the mere apology for a cool season only lasting for two months, it is hard work merely inhabiting tents, to say nothing of preparing designs and getting up intricate engineering schemes under the sweltering awning. It comes to this, that when works of novel construction or considerable size have to be undertaken in India, it is desirable to employ a European staff and to protect them from the effects of climate at any reasonable cost. But if the works are small and widely diffused, and such as the natives are able to execute with far greater cheapness and speed than any European, if they only choose, it is of questionable utility to compel Europeans to direct the operations with an expenditure of motor-power that only the youthful can long stand and the restless enjoy. There has never been much attention paid in India to distributing engineering work in proportion to the competency, time, and powers of each member of the department. The first effort has been to perfect a chain of rules and form an inflexible system. This done, item after item of work has been brought within the vortex by simply including it in some one's charge who was bound to observe the departmental regulations, till the whole tone of the Indian works became one of overtasking. Nobody could do all that was expected of them, so that it has been a matter of forbearance or accident when any lengthy period has passed without the engineer actually executing the smaller class of works and repairs getting a reprimand. Till the close of the American War of Secession, public works were being very briskly pushed on in India under the surviving principles of the East India Company. The country was just being opened out, and the comfortable lethargy of palanquins invaded by the road and the railway. It was expected that the natives would rapidly adopt European ways of living, and exchange clay and thatch for stone and brick. Irrigation was to spread fertility, and pay investors 10 per cent. Sanitation was to dispel miasma. So that in every quarter of British territory the engineer was about, and the most stirring personage in his neighbourhood. No official worked longer hours or went into such unvisited corners of the district. At last the more obviously needed works have been completed, and those only have still to be carried out which form the demand of a very advanced country. Yet there is little encouragement to proceed with improvements, because the wealth of the population and the productiveness of the land have not kept pace with the extended facilities of locomotion. They have opened a market, but the first rush of raw produce has been succeeded by a dearth which has caused the failure or decline of many of the best mercantile interests at the presidency towns and inland settlements. At present there is no steady flow of capital to engineering works. Grants are obtained with considerable difficulty, and it is only where some political emergency favours a scheme that it is capable of furnishing high-class employment. The whole structure of native society operates against rapid material expansion. This is seen at a glance by comparing the native town with the European station close beside it. The one is a compact mass of badly-built houses, mostly single storied, and in which there is more clay than any other substance used in construction. Each room contains its four or five human beings, and the whole city may have from one to two hundred thousand inhabitants. Every article in the possession of the natives has a rickety appearance, and the problem uppermost is how to live on the smallest possible sum. If people are seen talking in the streets it is almost a certainty that they are discussing the price of food. Houses of the natives are generally built round a small central court-yard. They seldom contain any furniture, and the walls are about 8 ft. high. The several generations of a native family club together in the same establishment, so that there is no individual independence. The prosperity of one in the household means that the others will do so much less work. When a man obtains a Government appointment all his relatives flock to quarter themselves upon his bounty. Early marriage is the almost absolute rule, and the natives, as a body, are not long-lived. The inferior cheap garbage on which they live, the filth of their towns, and the weak constitutions and indolent habits most of them have inherited, all conspire to shorten existence. A native is extremely old at fifty years of age, and a woman at thirty-five. The rate of mortality in places like Calcutta is 59 per 1,000. In the Sepoy Army, where selected men are under European care, the rate is as low as 14 per 1,000. These several facts produce a great influence on a native's way of thinking and acting. They are essentially different from those of a European. The British station is an enormous contrast to the native town. Neat plastered houses, constructed to admit a flow of the purest air, and of very large size compared to a native house, which last is on the scale of one of its stables or store-rooms, stand in an ample enclosure. There are from four to eight commodious rooms in an English house, and the whole are appropriated to the use of but two adults. The accommodation for 100 European residents covers as much ground as a native city of fifty thousand people. So far from being contented with a subsistence, the European is striving to obtain a competence. He affects some elegance in his furniture, tidiness in his grounds, and cleanliness reigns in the neighbourhood of the bungalow. The roads in the European settlements are well kept, and it is, in fact, a complete contrast to the squalid purlieus which the natives not only inhabit, but really like. Whether all do or not, their circumstances prevent any important assimilation to European habits as it was at one time expected would occur through education. Natives cannot be Englishmen. Their brightest time is in the immaturity of youth. There is no dignified evening of their days to be provided with substantial comfort and intellectual ease. The ambition of a native is to escape all kinds of labour that involve physical exertion and exposure to weather, by obtaining a public appointment, after leaving school, on a small monthly salary, with a prospective and still smaller pension. Natives, however, while their faculties last, are both clever and industrious. The only thing is, that they must be allowed to produce results in a different way from Europeans. They distribute a given task among a number instead of placing it in the hands of a sole person. This is of great moment to notice from an engineering point of view. Hitherto natives carefully educated as engineers, and who have passed high mathematical examinations, have been treated on entering the service as if they were Europeans. In consequence they appear much as fishes out of water. It is impossible to expect the same physical endurance in a native engineer as in one brought out from Great Britain. Nor will a native, who will wear out at fifty, have the same kind of ambition spurring him to effort as the Englishman, who is still in full vigour at that not advanced age. Besides this, the native is not a free agent. He is merely the member of a large household whose wishes he is obliged to consult, and whose slave he virtually continues while in employment. So that he is continually, work how he may, being reduced to mere subsistence level, and has no scope to found a career and domestic circle purely his own. If, therefore, a native is departmentally employed in the higher ranks of engineering, it is necessary to allot a diminished

charge, and useless to pay a scale of salary which ascends by rapid leaps. But under a purely native system of government, which would keep an engineer in one locality the whole of his service, while, on the contrary, British principles of administration would remove him to a fresh district every three or four years, an engineer would so establish himself as to be capable of controlling the same, if not more, district work than a European. The native would collect his relatives together, have all the most likely males well schooled and taught the elements of the profession, and then make use of them as assistants to himself. The head of the family would alone draw pay from the State as engineer; but his duties would be shared by several relations qualified to help, but whose names would not necessarily figure on the establishment-rolls. Other dependents of the family, possessing no education, would, notwithstanding this disadvantage, be turned to account. They would be posted to the different works as spies on the doings of the subordinate agents. In this way the native engineer would be able to exercise a very powerful check on irregularities of all kinds, and be prepared to make efforts with which it would be most difficult for a European to compete. The Public Works Department is so constituted as to prevent the formation of this sort of local influence. For want of it most of the native engineers appear helpless, and are liable to be set down as failures. But the civil business of the country is done by these convenient socialisms, though ostensibly only one responsible official is dealt with,—the magistrate-collector. It is here that the Revenue Department is stronger than that of Public Works. Agents intimately acquainted with a district, and long settled in it, can get work of an ordinary description executed with more certainty and less cost than Europeans, who do not live among the natives, and cannot hear what transpires. But these observations only apply to scattered local works, and not to costly single projects requiring science and organisation. The natives do not possess much administrative power. They make haphazard arrangements, and leave chance to do the rest. In these cases to have engineering work efficiently carried on, Europeans must be at the head of affairs. Natives have not had the opportunity of acquiring the necessary experience, and they have neither the perseverance nor comprehensiveness of grasp to control extensive undertakings and meet unexpected difficulties. It is just for the reasons that make English Engineers in request all the world over that some of them are needed in India. But it has to be recollected that it is not an opulent country, and will not for long have very many large works to offer. How far it is worth while to come out and undergo the disadvantages of climate for the sake of managing petty works of little professional interest is a personal question. It remains to give a description of the sort of life commonly led by the engineer at different stages of his advancement, and of any salient features of native society or India generally that may have been omitted, but fall under the notice of those engaged on public works.

THE MEDALS OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE twelfth ordinary meeting of this Institute (being the closing meeting of Session 1878-79) was held on Monday evening last, Mr. John Whichcord, president, in the chair. There was a very large attendance.

The Secretary, Mr. William H. White, announced that a large number of books had been presented to the library, including one on "The Abbey Church of Melrose," by Mr. F. Pinches, who would receive the Institute silver medal this year for some drawings submitted by him. It was also announced that the purchase had been effected of about seventy volumes of standard works from the libraries of the late Mr. F. P. Cockerell and Professor Cockerell.

The following gentlemen were balloted for, and declared to be duly admitted, viz.,—As *Fellows:* Mr. J. J. Stevenson, M.A., of Bayswater-hill; and Mr. Andrew Hetton, of Perth. As *Honorary Associates:* Mr. James Lattey, of Kensington; Mr. Edwin Freshfield, F.S.A.; Mr. E. S. Roscoe, of Harcourt-buildings, Temple; Mr. Morgan Howard, Q.C.; the Right Hon. W. H. Smith, M.P.; and Mr. Albert George Sandeman.

Mr. T. H. Wyatt, honorary secretary, said he regretted to have to announce that the Council had received a letter from the Marquis de Vogüé, stating that in consequence of the illness of a near relative he was unable to leave Paris, but that he had deputed the Comte de Florian, secretary to the French Embassy, to receive the Royal Gold Medal on his behalf.

The Chairman, in presenting the Royal Gold Medal to M. le Comte de Florian, as the representative of the Marquis de Vogüé, said:—Gentlemen,—It is my high privilege as your president to present the Marquis de Vogüé with the Gold Medal annually given by her Majesty the Queen, and necessarily the highest honour in the power of the Royal Institute of British Architects to bestow on any gentleman, be he member of the Institute or not, be he an Englishman or a subject of another and friendly nation. It is right that I should explain how the award was conducted. The Council, on the motion of Mr. James Fergusson, recommended that the medal for the current year be offered to the Marquis de Vogüé, then Ambassador of France at Vienna; their recommendation, which was unanimous, was unanimously accepted by a special meeting of the general body of members, convened on the 10th March last, and the royal assent, shortly afterwards solicited, was graciously accorded in a letter written from Buckingham Palace stating that the Keeper of the Privy Purse, having submitted our award to the Queen, was commanded to notify her Majesty's approval of it. It may perhaps be convenient that I should describe the origin and intention of this royal gift, for though the proceedings connected with it date back no further than about thirty-two years, little is now known of the trouble taken and the interest shown, not only by the President and Council of those days, but by the late Prince Consort, to ensure the success of a distinction both professionally honourable and artistically advantageous. It was in March, 1847, that the Council resolved to humbly request the Queen to permit "the Royal Medal to be conferred on such distinguished architect or man of science of any country as may have designed or executed a building of high merit, or produced a work tending to promote or facilitate the knowledge of architecture or the various branches of science connected therewith"; and with this resolution in his hand the late Earl de Grey, our president, went to the Prince Consort, who authorised him to say that the Prince fully approved of the proposal, and also that the Queen would sanction it. The Prince stated his opinion that the award of the medal should be varied in each succeeding year, that it should be applied as the Council of the Institute might periodically feel to be best for the general welfare of the profession; and a few months later the Prince Consort gave further proofs of the interest he took in the matter. When Mr. Wyon, the late well-known Royal Academician, submitted a design for the reverse of this medal, he was informed that the Prince Consort wished the medal to clearly show that it was the Queen's gift, and he suggested that, on the obverse, the words "Victoria Regina,—Cudi Jussit" should be introduced; indeed, there is preserved in our records a letter from Earl de Grey saying that her Majesty had desired, in giving the medal, to confer benefit upon the profession of British architects in the manner thought best by those who were the most interested and the best informed respecting such a matter. The career of M. de Vogüé has been of a character so in accordance with the modern idea of what a great archæologist ought to be, that I should fail in my duty were I not to trace, as rapidly as possible, the salient events of a life which may be advantageously studied by all men ambitious to explore, for the common good of the world, ancient countries once renowned, but now slightly peopled and little known. M. de Vogüé's first efforts in this direction were made while he was attached to the French Embassy at St. Petersburg, from 1849 to 1851, when he published some essays on the "Ancient Art of Russia"; and it was during the eventful period which preceded the establishment of the Second Empire that he commenced his study of ancient and Mediæval buildings, particularly of those in Eastern Europe, Western Asia, and the neighbouring African shores. In 1853-54 he visited Greece, Syria, and Egypt, the result of which may be seen in his well-known work on the "Churches of the Holy Land," as well as other minor works on the "Semitic Characters." At the close of 1861, M. de Vogüé started to join M. Waddington, his great friend, and now one of the most distinguished ministers in the French Cabinet, who had, six months before, explored parts of Central Syria, and made important discoveries. Together, during the whole of the year 1862, these travellers visited all the country now designated Central Syria, and soon after their return M. de Vogüé published his book on the "Temple of Jerusalem," and commenced the publication, in parts, of that extraordinary and valuable contribution to archæological science, entitled "La Syrie Centrale," being a series of accurate architectural drawings of numerous cities dotting a vast plain, and presenting a chain of monuments illustrative of early Christian construction between the fourth and seventh centuries of our era. In that exploration M. Waddington, who, though a French minister, has carried away honours from our Universities, and is the son of an Englishman, devoted himself to the study and collection of inscriptions, and M. de Vogüé to drawing and architectural research. Sketches for the plates illustrating "La Syrie Centrale" were prepared by the Marquis, assisted by Mr. E. Duthoit, an architect of distinction; and when circumstances permitted, these illustrations were completed on the spot. This was particularly the case for the drawings of Jerusalem, and for many of those of Djebel Semán. Every detail was measured and figured with the utmost minuteness, and photography was sometimes employed to aid the explorers. But apart from M. de Vogüé's literary and artistic fame, he is familiar to English architects as the bearer of a name associated with the Hôtel de Vogüé, a mansion that all of us know and some of us have seen,—a masterpiece of the Renaissance, situated at Dijon, and not the least instructive of those historical monuments for the conservation of which the French have passed statutory enactments enforced to the advantage of all architectural tradition, and to the special honour of their country. That celebrated residence, inhabited by the father of the marquis of whom I am speaking, probably fostered a taste for the arts which, hereditarily transmitted, led the young Melchior de Vogüé to seek occupation for his leisure in lands where the earlier records of history lay, like an open book, to be read by any one who could decipher and understand. The character of these archæological researches was not ignored by the French Government. In 1871 M. de Vogüé was nominated ambassador at Constantinople, where he remained until 1875, and where, while devoting himself to official duty, he could still continue his early study of Oriental art,—study that a few years before had obtained for him the envied distinction of membership of the Academy of "Inscriptions and Belles-Lettres." It now only remains for me to invest the Marquis de Vogüé with the Royal Medal, and in begging him to approach the chair I have but a few remarks of personal address to make. [The Comte de Florian having advanced to the front of the table, the President continued his address as follows.] Sir, I know that I speak the sentiments of the Institute of British Architects when I say that the offer of this medal to you is a sincere attempt to signalise the gratitude which we all feel for the assistance you have rendered us individually and collectively by the publication of the books now lying on this table, and which adorn our library. In former years, a similar token of respect was paid from this chair to Sir Henry Layard, Herr Lepsius, Mr. Fergusson, men not unknown to you; and I may add that while justly proud of a brilliant roll of Gold Medallists, we dare to assert that not the least distinguished among them are your compatriots,—our colleagues,—MM. Hittorf, Texier, Duc, Lesueur, and Viollet-le-Duc, the three first-named of whom are unhappily dead; while among our own countrymen are numbered Cockerell, Barry, Smirke, Pennethorne, and Wyatt. We have invited you, sir, to add lustre to the roll. I present you with the Royal Gold Medal, the gift of the Queen on the recommendation of this Institute, and in so doing I am glad to remember that it is given to an indefatigable traveller and archæologist, an honorary member of our own body, whose literary and scientific successes have been long recognised by the University of Oxford as well as by the Institute of France.

Professor Donaldson said it would be presumptuous in him to endeavour to add anything to the eloquent notice which the President had just read of the labours of the Marquis de Vogüé. The President had by his research laid before the members the various titles which the Marquis

had to their respect and admiration. The Marquis de Vogüé was a real archæologist, and, what was more, an architectural archæologist, for he understood particularly well all the necessities of architectural art, and he also understood the peculiar objects which architects endeavoured to effect in buildings suited to modern requirements. They, the British architects, admired him and his illustrious companion, M. Waddington, for the zeal with which they had undertaken their travels in a country which apparently offered very few attractions to men of culture. In the neighbourhood of Damascus the Marquis de Vogüé had found an architecture of the most interesting kind,—an architecture wholly of stone, for no wood was available even for the construction of floors or doors, which were all of stone. In fact, the Marquis de Vogüé had brought to the notice of the learned world what was hitherto regarded as an impracticable architecture, although, at the same time, an architecture of an elevated character. In the neighbourhood of Aleppo he found a similar class of buildings, and he had shown what were the constructions of the early Christians in the East, in the shape of churches, basilicas, and convents. He had further shown great judgment and taste in giving us plans, elevations, and sections of those buildings, showing with what constructive skill they were planned and erected. The drawings had been beautifully executed by his companion, the architect M. Duthoit. It was in the highest degree commendable that a nobleman like the Marquis de Vogüé should have voluntarily undergone the hardships and privations of travel in a desolate country in order to illustrate the architecture of a certain period,—an architecture of the existence of which the world was not aware until he made it known. In the works of Antoninus at Baalbec and Palmyra we saw the tradition of the architecture of the Romans carried out with great profusion and efflorescence; but the work of the Marquis de Vogüé had opened to us a new phase of architecture, and a phase well worth studying by the young architect, who might derive from it some new inspiration which might be turned to good account in the work of the present day. He congratulated the Institute upon having bestowed this year's Royal Gold Medal upon the Marquis de Vogüé, for the Marquis had done credit to his country and had done good service for architecture.

Mr. Charles Barry said that as he happened to be President when it was proposed to recommend to her Majesty that this year the gold medal should be awarded to the Marquis de Vogüé, he might say that perhaps it would enhance the appreciation with which the Marquis would receive the medal when he (the speaker) stated that famous, renowned, and worthy as no doubt the Marquis was, he was not the only worthy one whose name occurred to the Council as deserving the honour. He had, therefore, the credit of not standing alone in his merit, but of being pre-eminent in merit. It would also be gratifying to him to know that the gentleman who proposed his name to the Council, as a fit recipient of the medal, was Mr. James Fergusson, F.R.S., who was unfortunately unable to attend on the present occasion, owing to ill-health. Had he been present, he would have been able to emphasise the claims of the Marquis de Vogüé to the distinction about to be conferred upon him. The honour would be the more esteemed by the Marquis in consideration of the fact that it was conferred upon him at the suggestion of one who was his rival, though a friendly one, in archæological pursuits. The Marquis de Vogüé had carried on his researches under the greatest hardships and privations, and at his own sole cost, purely with the desire of advancing the knowledge of architecture. That the roll of the royal gold medallists had been highly honoured by the addition to it of the name of the Marquis de Vogüé would, he was quite sure, be the feeling of every member of the Institute.

The Comte de Florian, in responding on behalf of the Marquis de Vogüé, said: I am sure M. le Comte de Vogüé, who is prevented by an imperious family circumstance from attending this meeting of your world-renowned association, will deeply feel the honour which her gracious Majesty has been pleased to bestow upon him through the hands of your eminent chairman. He will also regret that he is unable to return thanks to you for this reward,—the proudest object which a scientific and learned man should aim at. In speaking for him, gentlemen as he has courteously asked me to do, I experience the difficulty of a task before which I would shrink most assuredly did it not give me an opportunity of greeting publicly the members of a body with whose history is connected the name of that royal prince who was associated with the best days of your Queen's family happiness and with the great artistical movement which has brought the name of your nation foremost in the pacific struggle for human greatness and progress. It is no slight satisfaction to me, gentlemen, to hear your chairman remind us that M. Waddington, before taking, with your most noble statesman, such an important part in maintaining the peace of the world, has shared the studies and the labours of your new gold medallist. Such labours and such studies are not an unworthy preparation for the task presently incumbent on a minister and a diplomatist. In seeking the secret of past civilisations in the sandy ruins of Central Syria they must have listened to the lessons of history, and learnt from her imperishable voice that nothing is lasting in this world except what is good, righteous, and fine. Let me, gentlemen, assure you that this honour is one not only for the Marquis de Vogüé, but also for my country, and I join his name with that of all Frenchmen in thanking her gracious Majesty and your Royal Institute for this much-envied distinction.

The other medals and prizes were then presented by the President, who made a few appropriate remarks to each recipient.

The *Pugin Travelling Studentship*, 1879, was presented to Mr. W. J. N. Milliard, one of eight candidates who had submitted drawings, sketches, and testimonials. A certificate of Honourable Mention was in the same competition awarded to Mr. Frederick Hemmings.

The *Soane Medallion* (with the sum of 50*l.* added under the usual conditions referring to Continental study) was presented to the author of the drawings distinguished by the motto "I strive,"—Mr. William R. Lethaby, Barnstaple. There were three other competitors.

Sir William Tite's Prize of 30*l.* (with certificate) was awarded to Mr. C. E. Sayer, author of the drawings submitted under the motto "Green Margins." In the same competition a Medal of Merit was awarded to Mr. Herbert Alexander Pelly, of Mitcham (motto: "*Patientia et Spes*"), and a certificate of Honourable Mention to Mr. Frederic Edwards, of Manchester (motto: "Acanthus"). There were three other competitors.

The *Grissell Gold Medal* was awarded to the author of the drawings submitted under the motto "*Dulce Domum*,"—Mr. G. H. Blagrove. There were three other competitors.

The *Institute Silver Medal* (with five guineas) was presented to the author of the drawings distinguished by the motto "*Labor*,"—Mr. Frederick Pinches. In the same competition a certificate of Honourable Mention was awarded to the author of the drawings distinguished by the motto "Architecture,"—Mr. Sydney Vacher. There were three other competitors.

The Architectural Examination.—The Secretary read the Report of the Council on the Architectural Examination, from which it appeared that in the Preliminary Class, out of nine candidates, four had passed, viz., Mr. William Balcombe, of Brighton; Mr. E. F. H. Nicholson, of Reading; Mr. Henry Rennie, of Sunderland; and Mr. Walter Scott, of Holloway. In the Class of Proficiency, out of eight candidates, seven had passed, but only two of the seven had passed in both sections, Art and Science; three had passed in the section of Art, and two in that of Science. Mr. W. Llewellyn Harford, of Manchester, and Mr. Bruce G. Capel had passed in both sections, and Mr. Capel was recommended by the Council to receive the Ashpitel Prize. Mr. F. G. Goldsmith, of Newport, Mon.; Mr. F. G. Sumners, of Nottingham; and Mr. W. Jacques, of London, had passed in the section of Art; and Mr. T. W. Moss, of Hornsey, and Mr. H. G. Maclachlan, of South Kensington, had passed in the section of Science.

The President then brought the proceedings to a close by announcing that arrangements had been entered into for carrying out without delay the contemplated improvement of the Institute premises, at a cost of about 2,700*l.* He observed that by the outlay of 600*l.* or 700*l.* beyond the 2,000*l.* formerly mentioned as the probable cost, the Council would be able to effect material improvements in the meeting-room, especially in regard to its efficient ventilation. Subscriptions were invited towards defraying the cost of the works, and it was stated that many members had agreed to double the amounts they had at first promised to subscribe.

Mr. Charles Barry remarked that it was desired that the London members should be the main contributors to the Improvement Fund, so as to provide a comfortable meeting-place for the country members when they visited London. In that way the London members would be able to show their appreciation of the readiness with which, a year or two ago, the country members agreed to increase their annual subscriptions to the same amount as that paid by the town members.

DRUMMOND'S BANK.

THE new premises at Charing-cross, now being erected for Messrs. Drummond, stand on the site of the former banking-house, and that occupied by four adjoining houses in Charing-cross and Spring-gardens. The new building will, therefore, be of considerable size, and will present a highly respectable appearance. Frequenters of the old establishment will at once be sensible of a change in its entrance, which has now been placed at the side instead of in the principal frontage. The access to Spring-gardens from Charing-cross will, we understand, be somewhat widened, and the effect of the short removal of the entrance from the main line of traffic to the comparative retirement of the side street will, no doubt, afford much comfort to those whom business may take to the new bank. A handsome porch will be here placed, which will add not a little to the dignity of the building.

The whole of the three frontages will be of Portland stone, and the massive columns and pilasters of the porch of red Mansfield stone.

The area of the new building is, roughly speaking, about 100 ft. square, but its irregularity of outline has exercised not a little the ingenuity of the architect. The greater part of the basement is occupied by the plate vaults and strong rooms, which have been constructed in the strongest fashion, and are covered with very thick brick arches. The remainder of the basement contains the domestic offices necessary for a partner's residence, but these are so constructed that they may at any time be added to the strong-rooms should such an extension of space become necessary.

The whole of the ground-floor is occupied by the bank offices, which, in pursuance of Messrs. Drummond's old-established system, will consist of several separate apartments, all of handsome porportions, and the height of which will be something over 16 ft. Besides the entrances to the bank and the partner's residence, there is a third entrance at Charing-cross which will give access to the upper parts of the house, but will have no communication with the bank proper. Here it is in contemplation to have several sets of chambers, should Messrs. Drummond find the accommodation of the upper floors in excess of their own requirements. The entire area of the ground-floor is covered by a fireproof construction of iron joists bedded in Portland cement concrete of great strength, and as has already been proved by experience, of great fire-resisting properties.

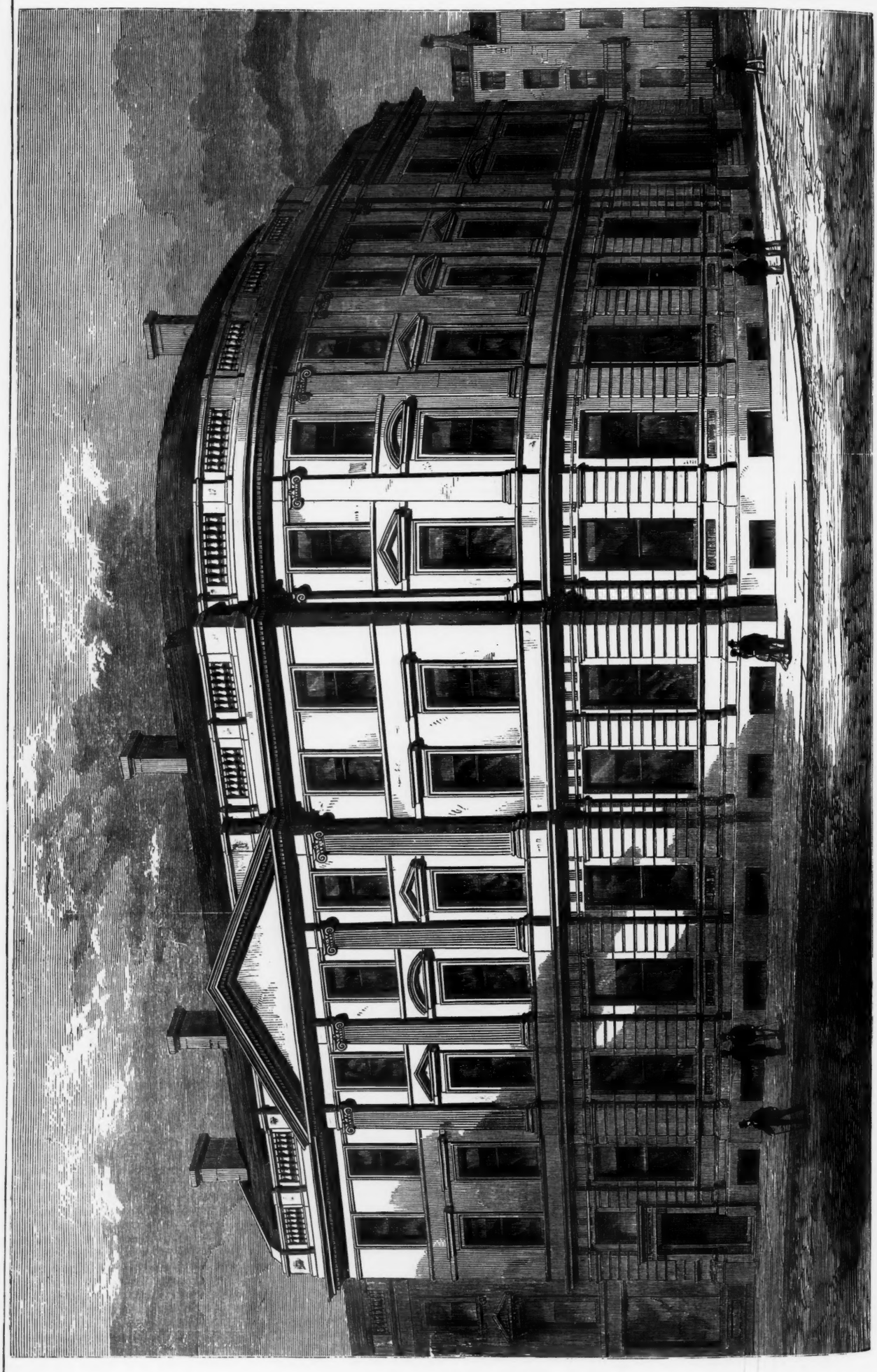
The upper floors of the building will contain an extensive suite of handsome rooms forming a partner's residence, and accommodation for at least a dozen resident clerks and a considerable domestic staff.

The foundations were a very serious matter, it being found on excavating that running sand and water existed over the whole area, and tradition assigns this site to a stream, an ancient tributary of the Thames. Nothing has been spared in rendering the foundations absolutely secure, the concrete having been taken down in trenches to the blue clay,—in many instances a depth of 21 ft. below the underside of the footings,—and the trenches of the principal walls were 7 ft. wide.*

Mr. Philip C. Hardwick is the architect; and the builders are Messrs. Waller & Sons, of No. 4, Lyall-street, Belgrave-square.

Mr. Thomas Bouch, C.E., the engineer and projector of the Tay Bridge, has received the honour of knighthood.

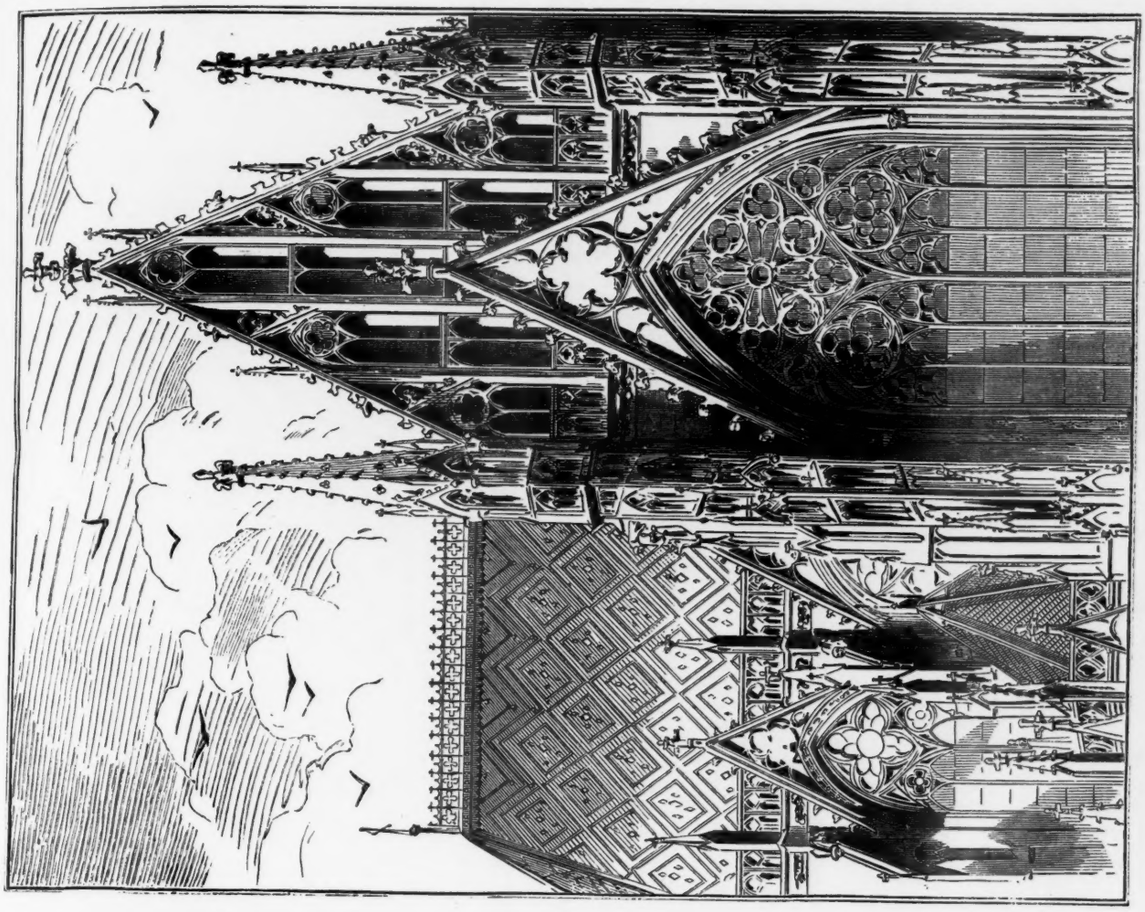
* We have already given some notion of these difficulties and of the means resorted to to overcome them. See p. 312, *ante*.

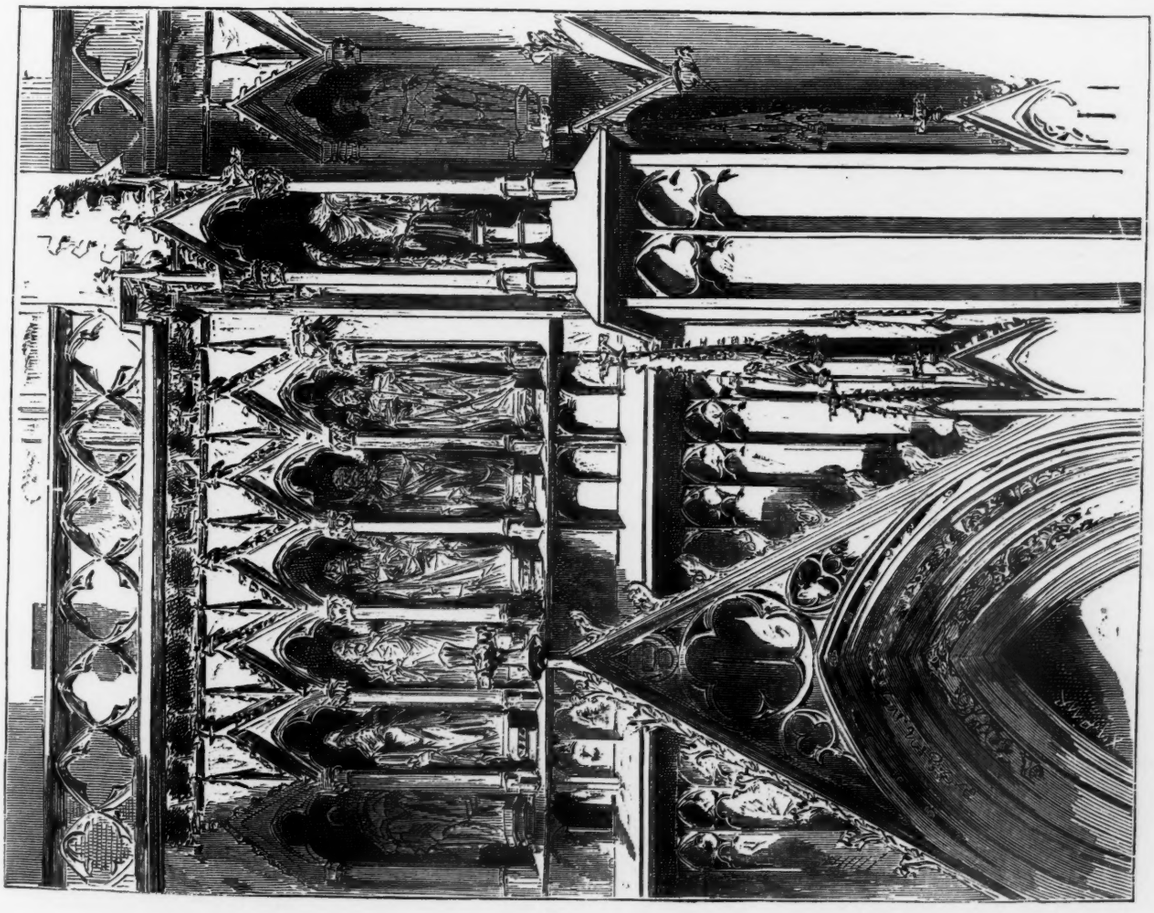


MESSRS. DRUMMOND'S BANK, CHARING CROSS.—MR. PHILIP C. HARDWICK, ARCHITECT.

INTERIOR OF THE VOTIVE CHURCH, VIENNA: DEDICATED TO THE SAVIOUR.—LOOKING TOWARDS THE CHANCEL.

HERR HEINRICH FERSTEL, ARCHITECT.





THE VOTIVE CHURCH, VIENNA.—PARTS OF THE EXTERIOR.

THE VOTIVE CHURCH IN VIENNA.

THE beautiful church dedicated to our Saviour (Salvator), in Vienna, of which we present several illustrations to our readers, a work of twenty-two years' labour, and consecrated on the day of the silver wedding of the Austrian imperial pair, conveys a solemn meaning. On February 18, 1853, a fanatic, the Hungarian journeyman tailor, Libeny, attempted the assassination of the Emperor Franz Joseph (then but twenty-three years old), promenading along the Kärnthnerthor-Bastei, accompanied by an aide-de-camp, Count O'Donnell. A woman passing,—who has remained unknown, just as the man has never been identified who saved the life of the Emperor Maximilian on the Martinswand in the Tyrol,—saw how the would-be assassin raised the knife behind the monarch's back; she uttered a cry of horror, in consequence of which Franz Joseph turned his head on one side. This movement saved his life. The weapon, instead of entering the fleshy parts of the neck, fortunately only struck a bone. Count O'Donnell and a Viennese of the name of Ettenreich threw themselves upon the would-be murderer, who made a desperate resistance, but was ultimately overpowered, and had to atone his crime on the gallows. The Emperor returned, covered with blood, but on foot, to the Burg, close by. The painful dagger wound, though giving rise at first to the most serious apprehensions, healed up, without leaving any injurious consequences, in the course of a few weeks.

The horror caused by this attempt was tempered by the joy at the recovery of the Emperor. To give a permanent expression to the general thankfulness, Archduke Maximilian (afterwards the ill-fated Emperor of Mexico) issued an appeal to all the nationalities of which the conglomerate Austrian empire is composed for funds for the erection of a commemorative church. Donations flowed in bountifully, and three years later the foundation-stone of the "Votivkirche" was laid in front of what was then still the Schottenthor. Now, in consequence of the rebuilding of this part of Vienna, it is in close proximity to the new University (built by the same architect), the new Town-hall, Hof-theater, &c., all buildings of the first order (illustrated in former volumes of the *Builder*). As a matter of archæological interest it deserves recording that the foundation-stone is a block of marble which was quarried on the Mount of Olives at Jerusalem, and is sunk under the centre choir chapel. Of no less than seventy-five designs submitted, that of the young architect, Heinrich Ferstel (a native of Vienna, and but 27 years of age), was selected, the architect receiving the first prize of 1,000 ducats. The work has been proceeding under this master's direction for twenty-two years. From the workshops of this church have proceeded those clever carvers in stone who were to find such an ample field for their skill on the monumental buildings of modern Vienna. Ferstel's plans were retained in their principal points. The high octagon cupola, however, which was to rise above the intersection, was, for financial reasons, replaced by a *flèche*, while the four polygonal chapels which are ensconced so snugly in the four corners between the nave and transept were added afterwards to the design.

The "Heilandskirche" (the Votive Church is dedicated to the Saviour) has a nave and two aisles, is 273 ft. long, and, including the side chapels, 99 ft. wide. The nave is 36 ft. wide, and 95 ft. high. It is intersected by a transept 156 ft. long. The edifice strikes the beholder less by its proportions than by the manner in which the architect has enlarged the spaces, and has disposed them in interesting combinations. In the nave he has effected this by pushing out further the side walls, by means of which two rows of side chapels have been created, while the transept almost creates the impression of a triple space, caused by the four polygonal corner chapels. The façade, flanked by two imposing towers 309 ft. high, forming the principal feature of the church, is broken by three portals.

The late Archduke Maximilian, a man of high artistic taste and culture, had selected the Gothic style as the most suitable. Ferstel's work bears on the whole the character of the Gothic which has left its impression on the cathedrals of Northern France erected in the beginning of the thirteenth century. The self-supporting character of the whole structure is expressed with great freedom both in the massive membering of the façade and in the flying buttresses of the sides. The nave especially expresses this decidedly; the façade, nevertheless, is not devoid of such ornamentation as is inseparable from the Gothic style of architecture. The three doors and the gallery running right across above them are richly adorned with statuary. The centre door reaches right into the large circular window, above which rises again the centre openwork gable. In the façades of the transepts a single gigantic window, with charming details, is the striking feature; it is flanked by openwork turrets, and crowned by suitable gables.

These few hints supply only a general outline of the dimensions and arrangement of the edifice of which we give an interior view. A cheerful, variously broken light flows through the spaces, and produces a solemn feeling in the mind. The interior of the Votive Church would appear bare and cold, notwithstanding the playful light of the stained glass, if its walls and column shafts, the harsh tones of whose tints are not yet tempered by the dust of centuries, were not warmed up and enlivened by colour. Polychromy has here come to the assistance of Gothic architecture. At the base of the building an already darkened stone tint prevails, while the vaults are covered, upon a grey or blue ground, with geometrical designs, and the principal panels, as well as the spandrels of the choir, are adorned by mural paintings representing scenes from Holy Writ. In the nave they represent God the Father in Paradise, the genealogical tree of Christ in several panels, the Virgin, and the Saviour; the transept and choir containing several paintings of saints, by Franz Jobst. The vault of the intersection has been painted by Laufberger, the subject chosen being the four Evangelists, venerating along with some angels the Lamb of God. The wall spandrels of the choir contain seven compositions by Führich (his last work) from the history of Noah, executed by Wörndle, and the four elements, as well as the four symbolic animals, by K. Jobst. The spandrels in nave and aisles are adorned by the coats-of-arms of the Austrian provinces, indicating that the building has been erected from the contributions of all the nations of the empire. In the choir, finally, Franz Jobst has represented in a series of compositions the three principal feasts of the church, Christmas, Easter, and Whitsuntide.

Sculpture has, as a glance at the façade will teach us, contributed no less to the beautifying of the church than painting. In the interior, the ante-church and the various chapels show us no fewer than thirty-three statues by Erler, Purkartshofer, Zafouk, Gastlunger, Becher, Glieber, and Fessler. The figure of the angel (above life-size) placed in the inside of the principal door is by Oberecker. The corner chapel to the right contains the first sepulchral monument of the Votive Church, the imposing sarcophagus, adorned with reliefs, erected by Karl and Ferdinand I. to the memory of Count Niklas Salm, who defended Vienna so bravely in 1529 against Soliman II. The monument stood originally in the Dorotheenkirche of Vienna, was moved after the demolition of that church to the estate of Raitz, near Brünn, belonging to the Salm family, and thence, at the instigation of the Vienna Archæological Society, removed to the Votivkirche.

The principal altar has a vaulted canopy, of Istrian stone, resting on four columns of red granite. A pinnacle rises above the point of intersection. The whole is richly adorned by the figure of the Saviour, 6 ft. high, and several smaller statues, with painted single figures by Laufberger, and four glass mosaics in the gables; the front one is a present from Pius IX. Below this baldacchino stands the altar-table, of white Laasch marble, with six pillars of yellow Egyptian marble. The reredos, adorned by pillars, and ornamented in enamel and with wrought decorations, is a good piece of native work in gilt bronze, made by Brix and Anders. Amongst the remaining altars, executed in similar material, but less richly finished, the altar erected by eleven Austrian Arch-duchesses in memory of the silver wedding of the imperial pair deserves notice. The pulpit stands in the last arch to the left, quite free, and is composed, together with its stairs, of the same material as the altars. A most imposing piece of work is the font, wrought of Egyptian marble. The well-wrought railings, mountings of doors, &c., come from the workshops of Wilhelm, Milde, and Gridl. The brass candelabra and the gas chandeliers are *chefs-d'œuvre* of Hollenbach and Hanusch, who have supplied also the greater portion of the altar vessels. The organ, in gilt case, containing sixty-three registers, with over 3,000 pipes, is built by Walker, of Ludwigsburg. The 20,000 square feet of floor are inlaid with encaustic tiles of the Wienerberger Ziegelfabrik.

The principal decoration of the interior consists of seventy-eight windows, of all sizes, and mostly containing figure representations in stained glass, the designs of which originate with eleven Austrian artists, among them Führich, Steinle, Laufberger, Jobst, and Trenkwald. The technical part of this work was executed by the stained-glass works of Geyling of Vienna, Neuhauser of Innsbruck, and Kratzmann of Pest. These windows, which cost nearly 30,000*l.*, were founded by the members of the imperial house, the higher aristocracy, the clergy, corporations, towns, and wealthy private persons. One of the windows in one of the choir chapels was presented by the workwomen of the imperial tobacco manufactories. The principal events of the church history of the several crown lands are commemorated by twelve large and thirteen smaller windows.

The cost of building, defrayed, as already mentioned, from voluntary contributions, together with a grant made from the city improvement fund of 80,000*l.*, is about 400,000*l.* This sum does not include the numerous gifts in kind presented for special purposes, such as bells, altars, vestments, church banners, altar vessels, paintings, building material, articles for fitting up, and gratuitous labour.

The Votivkirche will be surrounded on three sides by houses erected in the style of the German Renaissance; facing the entrance, in the centre of ornamental grounds, will be placed the Tegetthoff monument by Kundmann.

The bells of the towers were rung for the first time on December 2, 1873, the twenty-fifth anniversary of the accession of the Emperor Franz Joseph. The church was not consecrated until April 24 last, by Cardinal Prince-Archbishop Kutschker, in the presence of the whole Austrian episcopate. After the consecration the Emperor and Empress attended the first mass celebrated in the building.*

A NEW MUSEUM FOR LONDON.

LONDON is fortunate in possessing many institutions worthy of such a metropolis, in which may be studied the component parts of the earth, the products of every clime, the masterpieces of art, and the handiwork of the craftsman who has utilised the discoveries of the man of science. The geological formation of the globe, from the Sussex Downs to Mont Blanc, has been laid open and classified again and again; botanical research has been aided by well-stored museums; art has long had its national galleries; but hitherto the science of hygiene has lacked these aids to its advancement.

It may, therefore, be assumed that all interested in the progress of knowledge will rejoice to learn that there is a prospect of the deficiency alluded to being adequately met.

As a result of the valuable labours given to the study of hygiene by the late Dr. E. A. Parkes, sufficient enthusiasm has been aroused in gentlemen well known for the interest they take in the national well-being to induce them to voluntarily undertake the onerous task of forming an institution, which shall at once be an appropriate memorial of Dr. Parkes and a worthy addition to the public educational institutions of our country.

The new institution, named the *Parkes Museum of Hygiene*, is to be publicly opened this Saturday, June 28th, by one of her Majesty's Cabinet Ministers, the Right Hon. R. A. Cross, M.P.

Dr. Parkes, recognising as he did that the whole nation is interested in the proper treatment of every one of its members, and for its own sake ought to see that the relations between individuals are not such as in any way to injure the well-being of the community, would have rejoiced to see the Secretary of State for the Home Department occupied in presiding at the inauguration of an institution

* Views of the exterior will be found in previous volume of the *Builder*.

charged with the mission of promoting the study of this important science.

Dr. Parkes, in his "Manual of Practical Hygiene," calls attention to the fact, as others had done before him, "that in many parts of the country the cottages are unfit for human beings. In many of our towns the cupidity of builders runs up houses of the most miserable structure, for which there is, unhappily, no lack of applicants; or masters oblige their men to work in rooms or to follow plans which are most detrimental to health."

As an illustratian of the good that would accrue from a better national sanitary condition, the army, which is regulated by the State, is referred to in the same work as affording unmistakable evidence that, whereas "nothing is so costly as disease, nothing is so remunerative as the outlay which augments health." It is well understood, however, that there are cases in which the State can hardly interfere with effect, and that the growth of sanitary knowledge and the pressure of public opinion can alone cure the evils incident to our imperfect civilisation.

Whether disease will ever disappear altogether we need not here inquire, but it is satisfactory to find the following expression of opinion by Dr. Parkes:—"In the midst of all our weaknesses, and all our many errors, we are certainly gaining knowledge, and that knowledge tells us, in no doubtful terms, that the fate of man is in his own hands. It is undoubtedly true that we can even now literally choose between health and disease; not, perhaps, always individually, for the sins of our fathers may be visited upon us, or the customs of our life and the chains of our civilisation and social customs may gall us, or even our fellow-men may deny us health, or the knowledge which leads to health; but, as a race, man holds his own destiny, and can choose between good and evil; and as time unrolls the scheme of the world, it is not too much to hope that the choice will be for good."

In order to bring about such a consummation it will be necessary for the public to give its support in no ungrudging spirit to the new institution. Although as yet unprovided with an independent building, it already includes a valuable collection of articles and books relating to every branch of hygiene, and occupies an area of 4,000 square feet in rooms generously placed at the service of the committee by the Council of University College.

The collection comprises plans and other drawings of important public works in connexion with architecture and engineering, including those of the Thames Embankment and the whole of the metropolitan system of drainage; many of the sanitary appliances now made in connexion with drainage, ventilation, warming, and lighting; specimens of furnishing on hygienic principles; the nucleus of an extensive food collection; and appliances designed for the protection of life from accidents and diseases to which those following dangerous employments are liable.

The executive committee, who are responsible for the management of the museum, and to whom much credit is due for having brought it to this state of forwardness, consists of the following gentlemen:—Sir W. Jenner, Bart., M.D., K.C.B., F.R.S.; Prof. W. H. Corfield, M.D.; Prof. J. E. Erichsen, F.R.S.; Rogers Field, M. Inst. C.E.; Geo. Godwin, F.R.S.; Professor G. B. W. Kennedy, C.E.; Professor T. Hayter Lewis, F.R.I.B.A.; Mr. J. N. Radcliffe; Prof. Sydney Ringer, M.D.; J. C. Steele, M.D.; Professor A. W. Williamson, F.R.S.; Professor Berkeley Hill; W. R. Gowers, M.D.; and G. V. Poore, M.D.

It is pleasing to be able to state that many of our most eminent public men and women have given their support to the committee, and that her Majesty the Queen has expressed her approval of the work by a contribution of 50*l.* to the funds of the Museum. Several of the learned societies have given their support, and valuable contributions have been made by the Government of the United States and the authorities of the city of Brussels. Mr. T. Twining, the liberal founder of the Economic Museum at Twickenham, has been most active in assisting the committee.

The Museum, with Mr. Mark Judge for curator, is to be open free to the public on Tuesdays, Thursdays, and Saturdays, so as to enable as many as can do so to visit it, and it is to be hoped that the attendance at its inauguration will be such as to inspire confidence in its future development.

ROADS AND ROADWAYS.*

Town Roads or Streets.—In dealing with town roads or streets, the circumstances differed widely from those which had to be borne in mind in respect of country roads. In forming the surface of a new street, the ratepayers looked to the following points, viz.:—1, cost of construction; 2, cost of maintenance; 3, cleanliness; 4, noiselessness; 5, facility with which gas or water pipes could be got at for repair or renewal; and, 6, healthiness. The proprietors of horses, carts, and carriages aimed at a pavement with (1) easy traction; (2) safety and freedom from slipperiness; (3) comfort in travelling without jolting, which would destroy springs and wheel-tires; and (4) a surface which would not be unduly destructive of horses' shoes and hoofs. To some extent these two sets of interests might appear to be in conflict; but it should be remembered that many ratepayers were also owners of horses, and as the trade of a town was so largely dependent on the facilities afforded for the carriage of goods and passengers, it was better to endeavour, as far as possible, to meet all requirements. The great enemies of the town surveyor were the gas and water companies, with their powers to open streets. In town streets it was even more important than in country roads to have a good foundation for the road-surface, as the very best and costliest system of road-surface would fail unless the substructure were firm. In small towns, and in the less busy streets of large towns, macadamised roads were common. They were not, however, suitable for streets with much traffic, on account of the cost and frequency of repairs, and the great expense of scavenging. The "core" or foundation of the road-surface should be (especially when heavy rollers were used) of such a character that the small stones of the macadam might bed into it. If the foundation was too hard to allow of that, the passage of the roller would form a kind of wave in front, and the process would resemble that of rolling out pastry with a rolling-pin. Concrete in cement which would rapidly set and become hard in a short time was, therefore, objectionable, although it was used, under exceptional circumstances, by Mr. (afterwards Sir) John M'Neil, under the superintendence of Mr. Telford, at Highgate Archway in 1829, when Roman cement was laid in the proportion of one of cement to eight of stones and sand. In London and the suburbs the "core" was generally made of brickbats and other hard materials or rubbish. Burnt ballast was also extensively used, but unless very well burnt it would, after a time, resolve itself into mud. The core, which should be consolidated by rolling, and be not less than 6 in. thick, was covered with the broken stone, put on in thin layers (one stone deep), the roller or traffic passing over each layer; this was continued until the metalling was 6 in. deep. In this way the road was made solid during construction, and the mucadam was so bound together as to form a sort of mosaic work. Between each layer clean gravel or hoggin was spread in small quantities, and the surface was kept well watered. The gravel tended to fill up any interstices which might exist between the broken stones. In London, the metalling employed was frequently larger than that requisite for making a good road. A ring 2½ in. in diameter was the maximum size through which the metalling should pass, and in reality, a ring 2 in. in diameter was large enough. The stones should not only be angular, but as nearly as possible cubical, and uniform in size. Some authorities, however, argued that when rollers were used, large stones were preferable, but the heavy rollers so often used, instead of pressing the materials into place, crushed the stones and disturbed the foundations and surface. It was better to roll the surface with a light roller frequently than to use a heavy roller less frequently. Five tons were quite sufficient for the weight of a roller, for if it were of greater weight, not only was the road disturbed, but the gas and water mains were liable to be injured. The broken stone used in London (except in some bye and suburban streets where flints were used) came from Aberdeen or Guernsey, the price per cubic yard being about 16s., delivered. The cost of forming a new road with such stone was:—

	Per Super. Yard. s. d.
Excavation, 1 ft. 6 in. deep	1 9
Core of brick-bats and rubbish, 12 in. deep	1 6
Guernsey granite, 6 in. thick, including spreading, rolling, watering, and hoggin	3 6
Total	6 9

The cost of covering a road with a coating of Guernsey granite, including picking, rolling, watering, and hoggin, was 1s. 2d. per yard super. The cost of repairs to macadamised streets in large towns was necessarily heavy. Mr. Jacques, the surveyor for the St. Martin's and Strand districts, informed the author that the road at Charing-cross, below King Charles's statue, where there was a steep incline, cost for maintenance when macadamised (it was now paved) as much as 5s. per square yard per annum, without scavenging. Streets such as Parliament-street cost for maintenance, when macadamised, from 2s. 3d. to 3s. 6d. per square yard per annum. The smaller streets with light traffic cost about 6d. or less per square yard per annum.

Stone Paving.—Paving with stone was the most ancient system of forming a road surface. Although the most expensive to lay down, it lasted longer than any other kind of road, so that, in the long run, it became the cheapest pavement (asphalte, perhaps, excepted); but the noise, accumulation of dirt, and wear and tear to carriages and horses, were serious drawbacks. Under ordinary circumstances it afforded a safe foothold, but the joints between the stones, harbouring mud, rendered it slippery on certain occasions, and expensive to keep clean. When each individual stone presented a large surface, a horse had no chance to recover itself should it slip or slide; hence the width of stones should be diminished to 4 in. Formerly the stones were large, and but little attention was given to this point. The setts were never more than 9 in. deep, and that only where the traffic was very heavy, as in the City of London. In other parts of the metropolis the depth of the setts was usually 7 in., and the width 3 in., except at crossings, where the width of the setts was 4 in. The length of the setts should not exceed 12 in. (the average length was about 10 in.), otherwise they were liable to tilt when the weight was on one end only. Stones 4 in. cube were often put down in streets of light or non-continuous traffic or in courts, and in such cases they made a very neat and suitable surface. In large towns the setts should be durable granite or trap, but in small provincial towns local stone (such as limestone or sandstone) might be used. Colonel Haywood, in his report in 1871 to the Commissioners of Sewers for the City of London, says:—

"For public convenience, the hardest, most durable, and therefore the most economical granites are not employed. From time to time, indeed, hard granites and other stones have been tried, but have invariably caused so much dissatisfaction that they had to be removed before they had been down many years, and the grey or blue granites from Aberdeen, or those of similar character, have almost exclusively been used in the City as meeting the general exigencies of the traffic."

The foundation for stone paving should be well prepared. The ground, after being rendered hard by rolling or punning, should be covered with lias lime or cement concrete, or with a hard core from 6 in. to 12 in. thick. The paving stones should be evenly bedded on a layer of sand about 2 in. thick, spread over the concrete or core. The stones should be laid in regular, straight, and properly-bonded courses, free from protuberances on the surface, and well rammed to form an even surface. The joints between the setts, which were close, were grouted with lias lime to make the surface solid and impervious to water, after which the whole surface was coated with fine hoggin, when the work was complete. In Manchester, Hull, and other northern towns, the joints were filled in with artificial asphalte. The prices for paving varied with the area and the locality, but in London they were:—

	Per Super. Yard. Setts 9 in. by 3 in. s. d.	Setts 7 in. by 3 in. s. d.
Granite pitching delivered on site, but not laid	17 0	14 6
Setting the same, including sand	1 6	1 6
Grouting, including cost of lime and labour	0 5	0 4
Total's	18 11	16 4

The above figures do not include the cost of excavation nor the concrete foundation. Four

* Abstract of a paper by Mr. G. W. Willcocks, C.E., read before the Civil and Mechanical Engineers' Society. (See p. 631, *ante*.)

shillings per square yard must be added to the above prices for setts specially dressed for crossings. With a good foundation, and stones of uniform depth, paving in a street of ordinary traffic would last quite ten years without repairs, and at the end of that period the stones could be taken up, re-dressed, and re-laid. The total life of a pavement was from fifteen to twenty years, after which the stones could be used for streets with less traffic, or broken up for macadam. The paving in the Edgware-road had been down about twenty years, and was still in a very fair condition.

Estimate for Repairs.

	Per Super. Yard. s.	d.
Taking up old pitching, dressing, and relaying the same	4	0
Grouting, including lime and labour	0	4
Total	4	4
Taking up and relaying paving, without dressing, but including grouting	2	0

Generally, it might be said that a granite pavement in the metropolis, well laid on a good concrete foundation, would last, with occasional repairs, upwards of twenty years, and at a cost to the ratepayers of only about 10½d. per square yard per annum, including in that annual cost the cost of a new pavement and its maintenance. Having described in detail the method adopted by the Metropolitan Board of Works in the paving of new streets constructed under its superintendence, the author proceeded to give details of the method of paving pursued in Manchester, Warrington, Hull, and Exeter.

Asphalte.—The Val de Travers Asphalte Company, whose material was described by the author as the best in the market, were still laying down their rock asphalte extensively in the City of London. Val de Travers compressed asphalte paving was first tried in London in Threadneedle-street, in 1869; it had never been relaid, and had had but few repairs, but it was still in good condition. Good asphalte became harder after having been laid for a time, the weight of the traffic on the surface compressing the component parts of the material. The actual wear of the surface was comparatively slight, and was so regular and uniform that hollows and holes rarely occurred if the material rested on a good foundation. Asphalte paving was applicable to provincial towns as well as to great cities, for Mr. Cobb, in his report to the Paving Commissioners for the town of Cambridge, in 1878, says,—"With our light traffic, it seems not unreasonable to infer that a properly-laid asphalte road in Cambridge would last half a century, and that with but little repair." Asphalte was the road surface which most nearly approximated to the ideal road of Dr. Lardner, and there was no doubt that in a flat street it was theoretically the most perfect roadway, as the friction to carriages was very slight. It certainly had the disadvantage of not affording a secure foothold for horses during damp weather, but when horses happened to fall there was less danger of their receiving injury than on stone pitching or macadam. But, however excellent asphalte paving was for a level street, it could not be recommended for steep gradients. Colonel Haywood gave 1 in 60 as the limit. Of all pavements, asphalte was the most easily cleaned, and its safety increased in proportion to its cleanliness. Freedom from dust was another of its advantages, and that alone was a great boon to tradesmen. The noise of traffic on asphalte was less than that on stone, but it was greater than that on wood, on account of the clatter of the horses' hoofs. Asphalte made, without exception, the best of footways; it was smooth, clean, and pleasant to walk on. Asphalte, however, could not be laid in wet weather; but it was ready for traffic a few hours after being laid down. In opening trenches for gas or water mains in an asphalte roadway a smaller amount of surface was disturbed than in any other system of pavement. Asphalte being impervious, no water could accumulate and cause unhealthy dampness. Asphalte as laid down comprised two varieties, the "compressed," and the "liquid" or "mastic." In the former case the natural rock was ground to powder, then heated, the excess of water it contained being driven off, after which the dry powder was loaded into carts with covers and brought upon the work. Then, without the admixture of any foreign ingredients, it was spread upon a cement concrete foundation from 6 in. to 9 in. deep, according to the traffic of the street. It was then, whilst in a heated state, strongly compressed into its place with hot irons into a homogeneous mass, so that, in fact, the original rock was reconstructed. The thickness of the asphalte surface when finished varied from 1¾ in. to 2¼ in. The Val de Travers Company laid their compressed asphalte in Cheapside and the Poultry, 2¼ in. thick for 16s. 3d. per square yard; in Gracechurch-street, 2¼ in. thick for 15s. 3d. per square yard; and in Wood-street, 2 in. thick for 14s. 3d. per square yard. These prices did not include the cost of excavation and concrete foundation, but related to the asphalte surface only. The company undertook to restore the roadway over openings for gas and water mains, or for other purposes, at 5s. 9d. per square yard, including making good the foundation. The company also guaranteed to maintain the carriageway of Cheapside and the Poultry at 1s. 6d. per square yard, Gracechurch-street at 1s., and Wood-street at 9d. per square yard per annum for fifteen years, and for the first two years free of cost. The compressed asphalte was the only asphalte that could be recommended for carriageways; but the liquid or mastic might be used in courts or for footways. In laying the former, little or no odour was noticeable; but in laying the latter, which had to be prepared on the spot in cauldrons, a very unpleasant odour was perceptible. In the execution of a pavement with the liquid or mastic asphalte, the rock was in the first place ground to powder, then brought to the scene of operations, and placed in cauldrons, together with a small percentage of bitumen as a flux. On the application of heat, the mixture became semi-liquid, when from 40 to 60 per cent. of sandy grit was added. The composition, after being thoroughly mixed, was spread over the concrete foundation in one layer, varying from 1 in. to 1½ in. in thickness.

Wood Paving.—Mr. G. M. Van Nort, Commissioner of Public Works, New York, in answer to a request of the Commissioners of Sewers for the City of London, says, in a letter dated February 10, 1873,—"My experience is that in thoroughfares subjected to heavy traffic, the best of wooden pavements is useless." He also stated that the life of a wooden pavement was not above five years. But since that opinion was given it had been proved that the life of a wooden payment could be considerably lengthened, owing to improvements in the formation of the foundation, and to due regard being paid to the sizes of the blocks and the system of laying. Wood-paving should be laid in streets with a moderate traffic and plenty of sun and air; in confined spaces, such as courts, it soon rotted, and became a source of much unhealthiness. The blocks should be laid on a firm foundation, such as cement or lias lime concrete from 6 in. to 12 in. deep, and as far as possible the surface should be rendered impervious to water. When the substratum was wet the pavement was subjected to rapid decay. Most of the patentees of wood pavements claimed that the elasticity of such road surfaces was a great advantage, but elasticity was, except within certain limits, a questionable quality. The wood should present a perfectly solid and rigid surface. Fir was the wood chiefly employed for paving, the harder woods becoming dangerous on being worn smooth. Colonel Haywood, in one of his reports, attributed the numerous accidents to horses on the ligno-mineral pavement to the use of beech mineralised. The best size for the wood blocks was 3 in. wide, 9 in. long, and from 5 in. to 7 in. deep. Care should be taken that they were cut from the parts nearest the heart of the tree. Although wood absorbed water, its powers of absorption did not affect the travelling over it, provided the surface were kept clean. Wood pavement in itself was not slippery, but was rendered so by the accumulation of dirt. Wood, next to Macadam, was the safest of all pavements. Should a horse slip he had a chance of immediately recovering himself. Some alarmists had asked whether wood pavements would not cause fires to spread from one side of the street to another. The author answered the question with a most emphatic negative. Much of the wood paving hitherto laid down possessed the objectionable feature of having a space left between the butt-ends of each block and between the rows of blocks, extending in some instances to as much as 1 in. in width. The edges of each block were thus exposed to the pressing and concussive action of the traffic, the latter action constantly increasing in its violence as the edges became more and more worn, until the whole structure was weakened in its compactness, and each individual block required renewal. By reason chiefly of the wear and tear of the edges and the vibration thus engendered, the life of a wooden pavement, even when the best quality of wood was used, was considerably shortened, and during its short life it required frequent repairs. Another great objection to the spaces between the blocks was that they harboured to a great degree the droppings of horses, the slime from which, when acted upon by the rain or watering, tended to produce slipperiness to a greater degree than the existence of the spaces tended to reduce it. The component parts of such a wood pavement were bound together either by a process of what might be termed caulking with a naturally disintegrating compound of washed gravel and pitch, or by sand grouting, or by cement run in between the joints. By reason of the vibration caused by these joints not being close, the binding substances were worked up to the surface, and being mixed up with the mud, re-entered the seams or joints. The water from the street was thus permitted to find its way to the foundation, to the detriment of the sanitary condition of the locality. These observations, of course, did not apply to those systems of wood paving which were filled with a substance of equal hardness and durability with the wood. It had been found necessary, in order to overcome the slipperiness of many wood pavements, to strew sand or gravel over the surface, thereby increasing the dust and mud, involving expense, and causing the surface of the pavement to be ground away. The question had been raised whether wood paving was injurious to health. By some it had been maintained that, considering the climate, if all London roadways were paved with wood, marsh fever or ague would become prevalent. It must be admitted that a certain amount of dampness was retained by wood, but it was very doubtful whether such results would follow as those referred to. Wood pavement should, of course, be well cleansed, for otherwise it would retain all sorts of organic filth. The point was referred to in Colonel Haywood's Report (1874) when speaking of cabstands paved with wood. No fear of unhealthiness need be entertained if the subsoil were rendered dry by an impervious coating. The author, in conclusion, described in detail the processes of the Improved Wood Paving Company, Croskey's close-jointed wood pavement, Shiel's composite block paving, the asphaltic wood pavement, Messrs. J. Mowlem & Co.'s pavement, Prosser's wood pavement, and Henson's patent wood pavement.

NORTHERN ARCHITECTURAL ASSOCIATION.

AT the annual meeting of the Northern Architectural Association held on the 17th inst., the President (Mr. T. Oliver) delivered his retiring address, in the course of which he said:—It would seem almost remiss in me were I not to refer to the commercial crisis through which we are passing. We may congratulate ourselves, as architects, upon having been so long in feeling its more serious effects, and we may fairly indulge the hope that we shall be amongst the foremost to participate in the beneficial results of a revival. But what may we expect will be the influence of this crisis upon architecture and upon ourselves? Architecture, as an art, may not be greatly affected by it, although revolutions, whether in forms of government, or in religious, political, or social developments, record themselves more permanently in art, such as in architecture, poetry, and music, than in any other manner. But we ourselves may insensibly become influenced. Our loyalty to our profession and to the public may be weakened; our gentlemanly etiquette, amongst ourselves more especially, may become impaired; and the evil spirit of fierce competition may take possession of us, causing us to be sevenfold more reckless than some seem to be at present. Already may be observed the withdrawal of large individual capitalists from extensive building operations; this, however, by reducing building prices, will open the door to those whose united mites rear churches, chapels, hospitals, and the like. Sanitary reform in large country districts will be deferred, and the labourer's cottage will remain unbuilt. But what is withheld in one way will, to some extent be distributed in another; and by this give-and-take principle we may fairly conclude

that business will again right itself satisfactorily. Religion and architecture have always gone hand in hand. Indeed, it has been said that architecture is the handmaid of religion. It is not with any degree of regret that I perceive in the "new departure" from the Gothic of Pugin and Scott the sign of an active living art; for just as it was considered perfect in the fourteenth century, and it passed away, so is it now. Shall it be superseded by Perpendicular Gothic, Romanesque, or the Italian Renaissance? All architecture has been engrafted. As stone took the place of wood, and the rock-cut temples the place of dismal caves, imperceptibly architecture reared its inexplicable and beautiful forms, first upon one civilisation and religion, then upon another, until it culminated in Christian Italian and Mediæval Gothic. Those imbued with the like spirit that inspired our predecessors, may select and combine, and in so doing produce a new and harmonious style of architecture more particularly adapted to our age and to our wants. During the twenty-two years of our official existence as a society, we have only had occasion to approach the corporation of Newcastle on two instances,—one in reference to the conduct of some of the subordinate officials acting surreptitiously as private architects, and afterwards reporting upon and passing their own plans; and latterly upon the important principle involved in the substitution of engineers in the place of architects to design and carry out the large public works required by the municipality. As a matter of principle I do think that engineers should not be required by public bodies to perform the work of architects. It is unbecoming the high dignity of any municipality to advertise for a "Borough Engineer and Town Surveyor," and to afterwards transfer to him the whole of the town's public architecture, leaving all the other engineering and surveying officials just as they were, save in responsibility and a knowledge of their respective duties. The corporation of Newcastle have hitherto been considered the patrons and conservators of architecture. During the eleven years that I had the honour of representing at their councils that far-famed ward, East All Saints, the fostering hand of the corporation was seen and felt on all occasions; and as an evidence of what it was, I may mention a circumstance that occurred a few years ago, when, after being successful in obtaining from the Corporation of Derby a premium for designs for new buildings, I was asked point-blank by a former resident of Newcastle, who happened to be a member of that body at that time, "Are your Corporation as particular as they once were about the architecture of Newcastle?" If I were asked such a question now, what should I have to say? Could I answer it? It is obvious that we must exert ourselves to the utmost to correct this irregular mode of conducting the public business of this truly architectural town,—for if we have not architecture to boast of, what have we?—and perhaps the best way to begin is to demonstrate the practical disadvantage and ultimate costliness of the system to the public, who have the matter in their own hands; or under the present morbid and abnormal influences, architecture may be reduced to mere building, and architects to mere draughtsmen. I cannot allow this opportunity to pass without drawing your attention to a letter, dated so late as June 2, 1879, which appeared in one of the local papers, wherein the writer says that the designs prepared by the engineer cost the ratepayers nothing. If this be satire, it may do; but surely no one, in view of present events, could be so *naïve* as to suppose the writer was in earnest. Mr. Oliver then referred at some length to the question of the Free Library and the Weavers' Tower; and on the subject of plans he said if the matter had been put to competition, he had no hesitation in saying that they might have had a design worthy of an architectural town like Newcastle. It is to be hoped, he continued, that if the Carliol Tower should be removed, the ridiculous ideas of transferring it or recording it by marble mosaics, or engraving a plate like a coffin-plate, will be abandoned. If it must go, let it go, and bury the bad feeling along with it. But if it could be saved, by all means let it be done.

A vote of thanks was accorded to the President for his paper.

The hon. sec. (Mr. W. H. Dunn) then read the annual report, and also the financial statement, showing a balance in hand. The report and statement were adopted, and the following officials were elected:—President, Mr. Oliver; vice-president, Mr. Oswald; hon. treasurer, Mr. Newcombe; hon. sec., Mr. Dunn; and hon. solicitor, Mr. Hodge.

GLASGOW INSTITUTE OF ARCHITECTS.

A MEETING of this Institute was held last week within the chambers of Mr. Wm. MacLean, the secretary, St. Vincent-street. The distribution of prizes took place. The competition was open to draughtsmen and pupils in the office of the members of the Institute and other architects in the principal towns of Scotland. The Institute had offered a gold medal for the best design for a library and reading-room suited for a small town. The president also offered a prize for the best series of drawings illustrating the portico of St. Andrew's Church, with details. For the Institute prize nine sets were submitted. The president stated that the committee appointed to award the prizes reported their opinion that the drawings given in for this prize were not of sufficient merit to justify the medal being awarded, but in order to mark their sense of the measure of labour and care shown, it was agreed to give a reward in books to the author of the best design. With regard to the president's prize, four sets were submitted, viz.:—A Whitford Anderson, in the office of Messrs. James Salmon & Son, I.A.; Wm. Holmes Howie, in the office of Mr. James Boucher, I.A.; B. F. Simpson, in the office of Mr. Wm. Landless, I.A.; Jas. Wilson, in the office of Messrs. D. M'Kissack & W. G. Rowan, architects. The prize in the competition was awarded to Mr. James Wilson. The book given was Gwilt's "Encyclopædia of Architecture." Mr. John Honeyman adverted to a matter which had engaged the attention of the Council about a year ago, namely, the expediency of establishing a more intimate connexion between the Royal Institute of British Architects and provincial societies. He said he had no doubt that this subject would soon be taken up in earnest by the Institute; and as he, as a member of the Council of the Institute, might be called upon to take an active part in the discussion of the subject, he was anxious to get some expression of the sentiments of the profession in Glasgow. He then explained the nature of the suggestions which had already been made.

The President (Mr. Campbell Douglas), Messrs. Baird, Mr. James Thomson (St. Vincent-street), Mr. H. M'Lure, and others having spoken generally in favour of promoting the unity of the profession, it was resolved that when the Royal Institute submit definite proposals the Glasgow Institute will give them their most favourable consideration. Before separating, the President called attention to the result of the Greenock Corporation inviting competition plans for their new municipal offices at less than the ordinary rate of architects' commission, and even less than they paid for some of their School Board work. The result, however, is that not half of the applicants for particulars sent in designs, and, with some exceptions, these apparently came from young and inexperienced men, and not from the class from whom it would have been desirable to get designs.

THE RESTORATION OF THE SOUTH-WEST ANGLE OF THE DUCAL PALACE, VENICE.

THE following communication from Venice will be read with interest:—

This large Gothic palace, whose construction, was begun in 1309 and finished about 1500, is by its architecture, by the pictures it contains, and by the history of the Great Republic written on its walls, the most interesting building in the world. Mr. Ruskin has described its façade and capitals with touching eloquence, especially that of the fig-tree or south-west angle, representing the planets, the zodiacal signs, and the creation of man.

This angle was threatened by inevitable ruin, caused principally by the oxidation of the iron bars inserted in the Istrian stone of the capitals and arches, which were found all broken, and even by the bad quality of the material itself (the mortar, for instance, was still found fit to mix, though it had been employed some five centuries ago). All these causes,—the inclination suffered by the columns, the slide of the voussoirs of the arcades,—required the demolition of all the parts of the angle, from the capital of the upper story to the foundation (about 12 mètres high), comprehending the two arcades pressing on the large capital. Except the capital of the upper story and the group of Adam and Eve, all the other parts will be new. Between the surfaces of contact of all the pieces demolished, there was some lead which had been melted to correct the irregularities of the stone, but in consequence of its imperfect flowing the pressure was unequally distributed, causing the fracture of nearly all the bases of the columns of the upper story, and necessitating the renewal of all these in the new work. The palace has not suffered the least movement from this vast demolition, though now 280,000 kilogrammes of the superincumbent weight are supported by the wooden shoring.

The rebuilding has already begun, and to transmit to posterity the memory of such an event, there was put under the base of the large column a small box of lead, enclosed in one of copper, containing an historical document on parchment, and some gold and silver money of the late Victor Emanuel and our present king.

Engineer Forcellini may be proud of the splendid success of his shoring, and even of the work in so far as it is completed; and as he hopes the supports will be removed towards the end of this year, I promise to detail the restoration of this first portion of the palace as soon as it will be finished.

GIACOMO BONI, Architect.

A GENERAL GRIEF.

THE following represents the feelings expressed by several correspondents, and doubtless participated in by many of our readers:—

My heart is heavy for the poor dead young prince, and his bereaved and doubly-widowed mother! Poor Empress Eugénie: throneless, husbandless, childless! All England shares her sorrow; would that we could lighten it to her! Her terrible bereavement is as a private grief to every English heart, and makes one long to find some way by which to assure her of the general sympathy. I do hope every English newspaper will avail itself of its privilege as a mouthpiece of public opinion to express the deep sorrow that is felt in every English home for the dire eclipse which has come over that other home, the home of England's guest, the now lonely, but once proudly-placed, Empress of the French. How glad all were when she and her boy son were safely refuged on our land. How deeply we felt for her in her sad days of early widowhood; and how affectionately we have watched her son grow up to manhood in our midst. And now to think that he is taken from the living, and has shared the fate of so many of England's best and bravest in this wretched war! All generous hearts will tender their sympathy to this sorely tried mother:—

"Hush, friend and foe! and let two lands,
Sisters in sorrow, link their hands
Across his grave.
Forget all else, O France, to-day,
Save that the exile far away
Was young and brave."

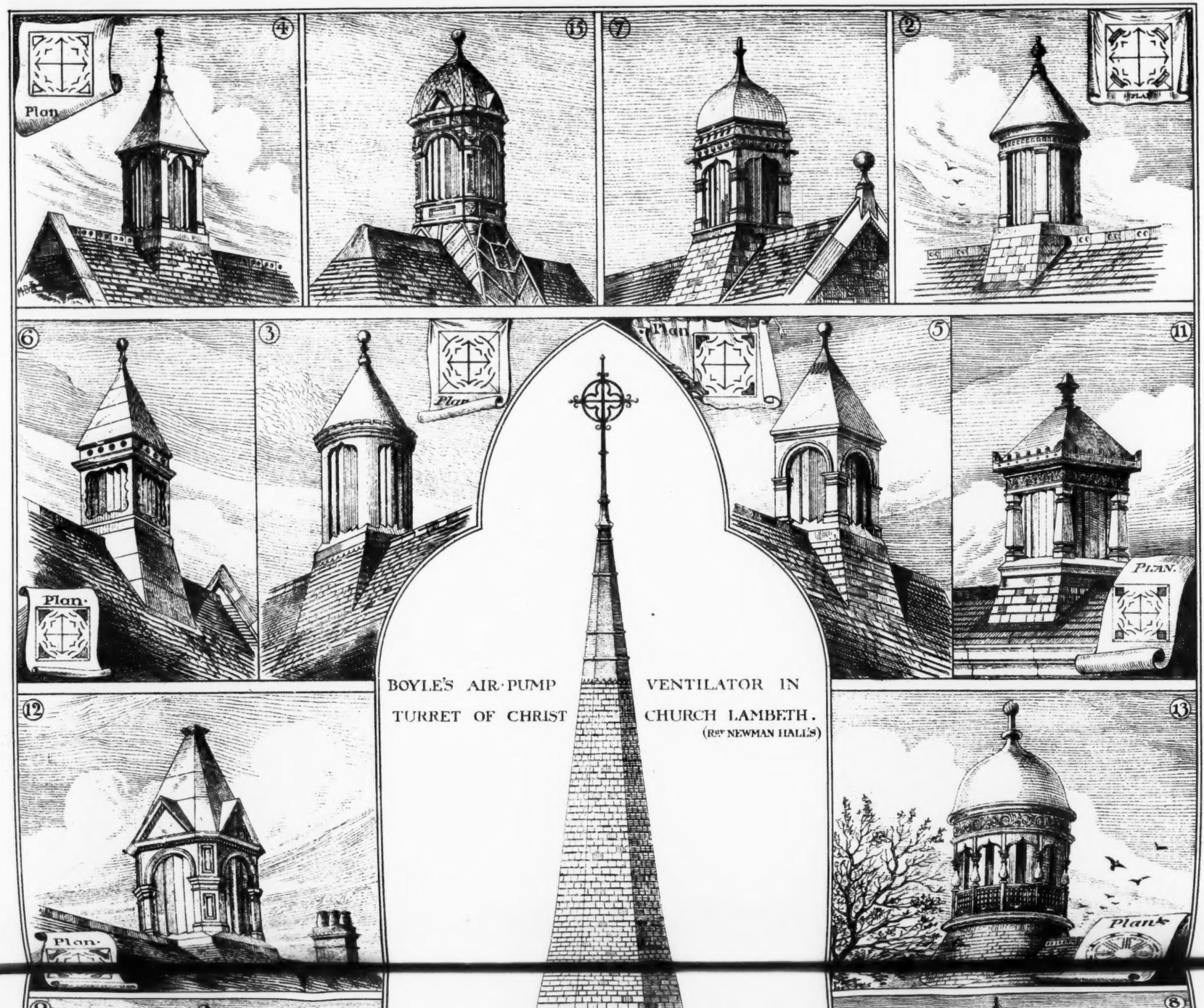
R.

It seems to stand to reason that a monument should, by public subscription, be erected, either at Chislehurst or in St. Paul's, to one who, making our quarrel his own, has been slain in the service of this country. Proper persons will doubtless move in it at once.

FROM ATHENS.

THE future resting-place of the excavated Olympian antiquities appears to have been finally fixed, it having been decided to erect a local museum on the spot. As we have mentioned already, the King of Greece is in favour of this project. He also advocates the extension to Olympia of the railway to be constructed from Patras to Pyrgos. All acquainted with the drawbacks of the Athenian Museum will receive this intelligence with pleasure. For in the most favourable case, the treasures transported to Athens would have to languish for years for a second resurrection in provisional dark rooms in that museum.

The idea of restoring the celebrated lion of Chæronea has already borne good fruit, the Greek Archæological Society having resolved to undertake the work at its own expense. The German Archæological Institute, by laying open a round vaulted sepulchre near Menidi, in Attica, has increased, by another monument, the number of "hero sepulchres," already considerably augmented by Schliemann's excava-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Plan
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PLAN.
BOYLE'S AIR-PUMP VENTILATOR IN
TURRET OF CHRIST CHURCH LAMBETH.
(Rev NEWMAN HALL'S)
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Plan.
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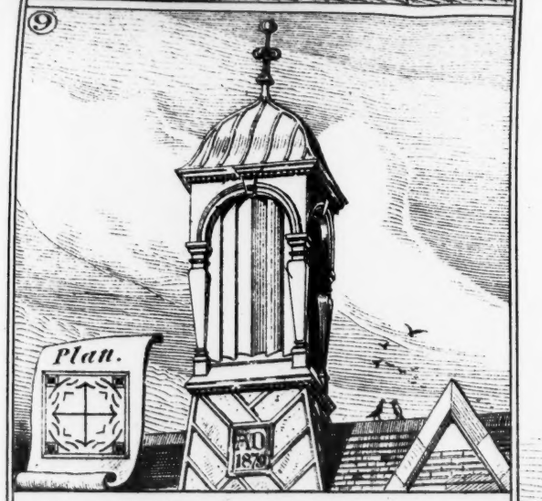

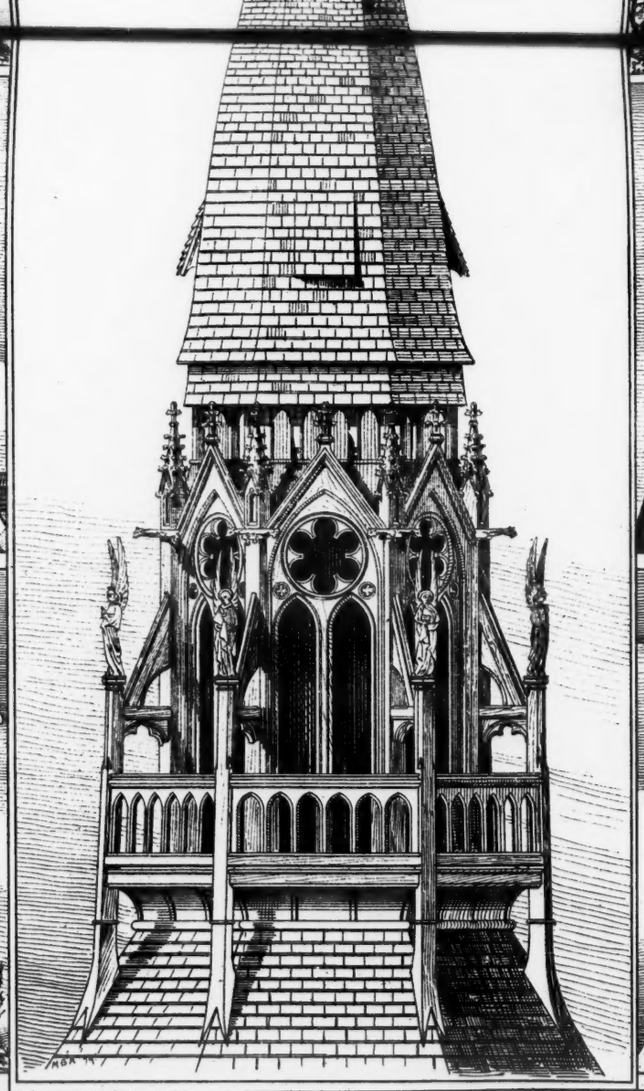

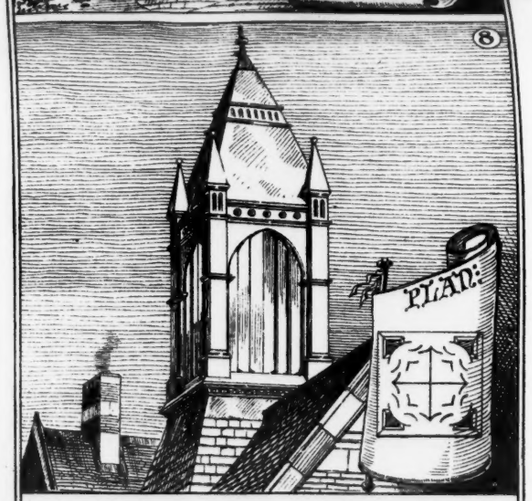

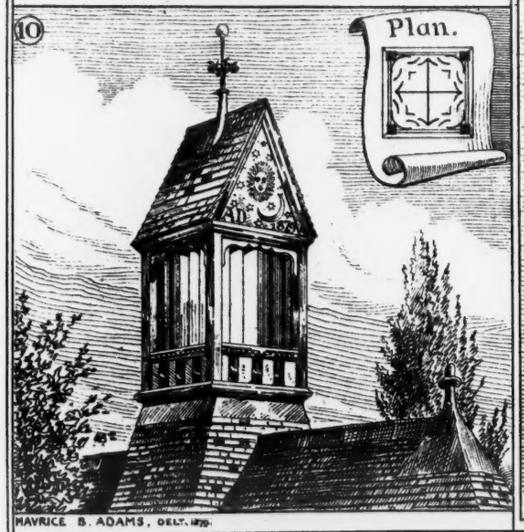

MAVRICE B. ADAMS, DELT. 1879.

ROBERT · BOYLE · & · SON'S

PATENT SELF-ACTING

AIR · PUMP · VENTILATORS ·

HEAD · OFFICE · GLASGOW

GLASGOW · 10 · Bothwell · Street ·
LONDON · Manston · House · Buildings
MANCHESTER · Exchange · Arcade

Can · be · made · in · WOOD · and · IRON · to · any · Architectural · Design ; fit · into · Turrets , Towers · &c · They · have · no · Mechanical · movement · and are · entirely · free · from · downdraught · EXAMPLES DESIGNED BY MAVRICE B. ADAMS. A.R.I.B.A

PHOTO-LITHOGRAPHED & PRINTED BY WYMAN & SONS 6 QUEEN ST. W.C.

tions. Its contents (pottery, objects of glass, flax, ivory, and some gold) correspond in parts exactly with what we already are acquainted with. Besides those of Menidi and Mycenæ, tombs of the same epoch, with similar contents, have been opened also at Spata (Attica), at Mount Palamedes, near Nauplia; and at the Argolic sanctuary of Hera.

BOYLE'S AIR-PUMP VENTILATORS.

A SUPPLEMENTARY plate in our present issue shows some of the various forms that may be given to Boyle's self-acting air-pump ventilators, as they are called, and we have not admitted it before taking evidence that they have been found to act well in a large number of cases. The self-acting air-pump ventilator of Boyle (now manufactured by the firm of Robert Boyle & Son, Glasgow) deserves the name at first chosen for it by the patentee. The appliance consists of four distinct series of louvre plates or diaphragms surrounding the central tube or shaft, which act independently of each other. When the external air, even when in the gentlest motion, impinges upon the outer plates, it is at once deflected at different angles over the central radial plates, and in passing out it exhausts the internal chambers, in consequence of which there is a partial vacuum created, a kind of air-pump action coming into play. Immediately there is a rush of air up the shaft leading from the place to be ventilated, so as to supply the place of the air extracted; and thus there is obtained a powerful upward current, without any down-draught into the apartment. As the ventilator is perfectly automatic in every part it requires no attention whatever. By reference to the illustration it may be seen that the air-pump ventilator can be easily adapted to any style of architecture, so that it need never be offensive to the artistic eye on any building on which it may be placed.

This invention has commended itself to persons of great scientific eminence, to distinguished architects, sanitarians, and others, in a remarkable manner. One correspondent says, "I will give an instance of the power of the air-pump ventilators which should be sufficient to satisfy any reasonable person of their efficiency. Rowland Hill's Memorial Church, Christ Church, Lambeth (the Rev. Newman Hall's), was ventilated by Messrs. Boyle & Son, and upon the architect, Mr. Paull, the builders, and others interested, testing the ventilator during the service, it was found to be extracting at the rate of 8,000 cubic feet of air per minute, or 480,000 cubic feet per hour. There was but a moderate breeze at the time. During the whole time the experiment lasted there was not the slightest downdraught experienced, nor was there at any of the other experiments, of which there were several. Three different anemometers were used, of the most improved construction and by the best makers. The size of the working part of the ventilator was 6 ft. by 9 ft., as near as I can recollect; the diameter of the shaft, 2 ft.; length, about 6 ft." The appearance of the ventilator as applied at this church is shown in the sheet of illustrations. It may be worth while, too, to mention design No. 1, as it is intended to bring the air-pump ventilator within the reach of all, and the makers propose to sell this ventilator about 20 per cent. cheaper than any they have hitherto made. This is important to architects, as with them the price of a ventilator is sometimes a hindrance to its use. Messrs. Boyle have spared no exertion to bring their ventilators up to the requirements of architects, and it seems to us they are entitled to their support.

THE IRON TRADE OF BARROW AND THE DUKE OF BUCCLEUCH.

DURING the last few days the Duke of Buccleuch has been on a visit to the Furness district, and it is stated that his visit is in some way connected with a reduction of the royalty rates on iron ore in his capacity as lord of the manor. The decline in the demand and in the value of hematite pig-iron has resulted in minimising the profits of manufacturers and in bringing down the wages of the workmen. It is now stated that if a reduction were made in royalty charges the district would be able to hold its own, even in the face of the competition of the east coast. The average royalty charged on iron ore is 2s. per ton, and there is a prospect of this being reduced by more than one half.

TIDE-WORK.

LIVERPOOL ENGINEERING SOCIETY.

AT the fortnightly meeting, on the 18th inst., a paper was read by Mr. E. Cornish on "The Management of Tide Work," in which the author described the plant necessary for, and stated the precautions to be taken when, constructing heavy masonry works in a tide-way.

He commenced by stating that an important point was to ascertain the direction from which the heaviest seas came, so that the end of the work in progress may be as much sheltered as possible. Having determined upon the point at which to commence operations, the position of the well for draining the foundation trench should be carefully considered, so that the lines of rails for supplying materials may be brought in conveniently and laid with easy curves. This position having been fixed, the staging should be erected over it, so that the "Goliath" or travelling-crane may be used for sinking the well and fixing the pump. The well should be sunk a considerable distance below the level of the foundations of the work to form a reservoir, for the double purpose of scouring out the "lauder" and quickly running off the water from the workings. The necessity of providing a blow lauder was pointed out for letting the water into the workings to the level of that outside, to prevent the rising tide from rushing in upon the "green" work, &c. The author recommended the chain-pump for this class of work, having had one working for eighteen months without requiring any repairs, and that it should be driven by a belt in preference to gearing. He next considered the staging, stating that the cost of timber in piles driven was three to four times that of timber erected as runners, &c. In place of the piles being spaced at about 13 ft. centres, he advised the adoption of 20 ft. centres, with double runners, as requiring less labour and being more economical.

THE METROPOLITAN DISTRICT RAILWAY EXTENSION TO ACTON AND EALING.

IN the course of next week the Metropolitan District Railway Company will add another three miles to their system by the opening of the Acton and Ealing extension to join the Great Western line, which has been in course of construction during the last two years. We understand that this extension in a north-west direction is to be opened for traffic on Tuesday next, the 1st of July, when the District Company will be placed in direct communication with the Great Western line. The new extension line, which commences by a junction with the existing line, a short distance westward of the Turnham Green station, proceeds in a north-westerly course across Acton Green, on an embankment about a mile and a half long, being about half the entire length of the line. In continuation to Mill-hill Park and Ealing the line passes through a deep cutting, the material excavated serving for the embankment. There is a considerable amount of bridge and arch work in the construction of the line. Close to Acton Green a brick viaduct of eight arches, with a girder bridge, carries the line over the roadway at an elevation of 19 ft., and from one end of the line to the other there are no fewer than thirteen bridges, some under and others over the several intersecting railways and roads. Close to the boundary of the Acton and Ealing parishes, a short distance from the late Baron Rothschild's residence, the line is carried by a girder bridge over the Richmond section of the South Western line and the Midland line to Earl's Court. This bridge is for the most part on the skew, this portion of it having a span of 109 feet, whilst the span of the square part is 60 feet. Some distance beyond this point the line is again carried over the Brentford section of the South Western line, where it attains its highest level. The line continues on this level until it intersects the Great Western main line, which it crosses over between Ealing Common and Ealing, by a plate girder bridge of three spans. From this point there is a descending gradient, the new line curving direct westward, and joining the Great Western line, on the same level. All the gradients are easy, the severest being 1 in 60.

There are four stations on the line, namely, at Acton-green, Mill-hill Park, Ealing-common, and in the Broadway, Ealing, being a separate station to that of the Great Western Company itself. All the stations are neat and commodious structures, and a special feature is their having dwelling-houses for the station-masters, the sleeping apartments being over, and the living apartments under, the booking-offices. The platforms of the several stations vary in length. The platforms of the Acton-green Station are 300 ft. long and 20 ft. wide, and at this station there is a subway communicating between one platform and the other. This station and the terminal station at Ealing, which is the principal station, are laid with wooden platforms, the platforms of the other stations being laid with asphalte. The Ealing Station has an ornamental iron roof, resting on three longitudinal lattice girders supported by columns. The platforms of this station are 220 ft. long under the roof, the entire length of the platforms, including the open, being 400 ft. The walls of the station are of concrete, divided into bays, similar to those of the Earl's Court and some other of the company's stations.

The line has been constructed from the designs of Mr. J. Wolfe Barry, the company's engineer, Messrs. Lucas & Aird being the contractors.

VALUABLE PROPERTY IN THE AUCTION MARKET.

ON Friday, the 20th inst., Messrs. Fuller, Horsey, Son, & Co. offered for sale the freehold plot of land, being part of the site of St. Dionis Backchurch Church, on the west side of Lime-street, with an entrance from Fenchurch-street. The area of the land is 4,800 superficial feet, exclusive of the portion taken by the Commissioners of Sewers for the widening of Lime-street. The particulars stated that the houses on the south side of the churchyard next Fenchurch-street and Lime-street were proposed to be removed by the Commissioners of Sewers for the widening of those streets, which would greatly increase the value of the site now offered for sale. The ground was said to be available for immediate building operations. As evidence of the present value of land in the locality, the auctioneer (Mr. Fuller) stated that land in the immediate neighbourhood had recently been sold at 11*l.* per foot, and he considered that the site which he now offered was worth 12*l.* per foot. The highest offer made for the property was 39,000*l.*, being at the rate of about 8*l.* per foot, when the auctioneer said it could not be sold at that price, and it was consequently withdrawn.

On the same day Messrs. Farebrother, Ellis, & Co. offered for sale a large range of buildings recently erected in Gracechurch-street, comprising four spacious upper floors, with numerous suites of offices. A considerable portion of the ground-floor is occupied by the Government as a branch post-office, and the annual rental of the property is estimated at 5,090*l.* per annum. It is held under lease from the Skinners' Company, for a term of eighty years from March, 1875, at a ground-rent of 2,325*l.* per annum. The property was described as being situated in the immediate vicinity of the improvements proposed to be effected by the Corporation, under powers granted by the Leadenhall Market and Improvement Bill, which it was stated could not fail to enhance its value. The sum of 28,000*l.* was the highest offer, which was not accepted.

On Tuesday last a sale of shares in several of the metropolitan hotel companies, and also other public companies, was conducted at the Mart, by Messrs. Debenham, Tewson, & Co. The property comprised thirty-six 10*l.* shares, 6*l.* paid up, in the Langham Hotel Company, which were sold at 17*l.* 10s. and 18*l.* per share; also 100 10*l.* shares, fully paid up, in the Westminster Palace Hotel Company, sold for 6*l.* per share. It was stated that the company was established in 1857, and that the dividend for the half-year ending June, 1878, was at the rate of eight per cent. per annum. Forty 10*l.* shares, fully paid, in the Alexandra Hotel Company, realised 8*l.* 10s. per share. This company has been established sixteen years, and it was announced at the sale that the financial year will end on the 30th instant, and that the last year's dividend was five and a half per cent. Fifty 10*l.* shares in the Charing Cross Hotel Company, fully paid up, were sold at 17*l.* per share; and fourteen 5*l.* shares, fully paid up, in the Brighton Hotel Company, realised 4*l.* 5s. per share. Twenty-five 10*l.* shares, fully paid up, in the Alhambra Company, were sold for 8*l.* per share. It was stated in the particulars that of late years the dividends of the Alhambra Company

have ranged between five and twelve and a half per cent. per annum. Fifty 6*l.* per cent. first preference shares of 10*l.* each, fully paid up, in the St. James's Hall Company, were sold for 10*l.* per share. Eighty-five 5*l.* per cent. preference shares of 10*l.* each, fully paid up, in the Brighton Aquarium Company, were sold for 7*l.* per share.

SANITARY STATE OF BLEADON, IN THE AXBRIDGE RURAL SANITARY DISTRICT.

IN the Return of the Registrar-General for the fourth quarter of 1878, fifteen deaths from diphtheria are reported as having occurred in the Burnham sub-district of the Axbridge Union. All these deaths, it is stated in a foot-note, occurred in the parish of Bleadon; and all, except one, were registered as malignant sore throat. The data thus furnished gave occasion for an inquiry by Mr. W. H. Power, who has just now reported.

After a careful inquiry into various possible causes, Mr. Power is compelled to confess his inability to assign a cause for the extensive and intense prevalence of diphtheria in this village. He shows the sanitary condition of the place to be very bad, and says, in conclusion,—"Having regard to the apparent absence in Bleadon of relation between insanitary circumstances and the dipththeria, I have not deemed it necessary to do more than refer briefly to the sanitary shortcomings of the place. But I think the attention of the Sanitary Authority should be directed to such parts of my report as deal with these matters. Especially should attention be given to the want of proper water-supply in certain parts of the village; to the risk of dangerous pollution of the parish and other wells; and to the need that exists for a better and safer method of dealing with excrement."

ARCHITECTS' CHARGES.

SIR,—In answer to the inquiry of "X. Y. Z." in the *Builder* of the 21st inst., he being desirous to ascertain an "honourable way to deal with his employer," I beg to suggest that he would be entitled to charge his client 3¾ per cent. upon the value of the works shown upon the original "complete" drawings, personal supervision being omitted, the works not having been carried out, and five per cent. upon the value of the works shown upon the revised or amended drawings; also, in addition, the surveyor's charges for measuring up works and certifying the builder's accounts for extras and omissions on completion of the works. The scale of architects' charges is divided thus:—

Part 1.	Preliminary sketches and designs, including survey of site	1¼ per cent.
,, 2.	General drawings, plans, elevations and sections, specification, and approximate estimate	1¼ ,,
,, 3.	Working and detail drawings	1¼ ,,
,, 4.	Personal supervision and superintendence	1¼ ,,
	Total.....	5

The above total charge of 5 per cent. does not include clerk of works' wages, but is estimated upon the value of the work executed, including the value of such material and labour as may be supplied by his client. Omitted works after "plans, &c., complete have been prepared and contract signed" should be charged under items 1, 2, and 3. In addition he is entitled to charge his client ½ per cent. for procuring and examining tenders for the works. (?) For arranging with artists, tradesmen, and others, for sculpture, stained glass, and works of a similar class for which he does not furnish the design, but to which he gives a general supervision, 2½ per cent. on the value. He is also entitled to charge his client at per day for alterations in the design, extra labour in attending committee meetings, and arranging disputes with adjoining owners. Travelling and incidental expenses are charged in addition to the above.

I may, perhaps, remind "X. Y. Z." that his client pays for the use only of the drawings, and that they remain his property on the completion of the work, when extras and omissions have to be measured, and bills of particulars supplied by the surveyor to the architect.

If "X. Y. Z." will invest in Hunt's "Architectural Surveyor's Handbook" and Molesworth's "Pocket-book of Engineering Formulæ" combined, published by Spon, Charing-cross, he will be able to go into all these matters for himself.

I hope this will not be taking up too much space in your valuable paper, which is, indeed, so valuable to some that they have been heard to exclaim late on Friday evenings, "Oh! I do so love my *Builder*." WILLIAM H. PIPE.

COST OF IMPROVEMENTS IN LONDON.

DIFFICULTIES OF THE ARTISANS' DWELLINGS ACT.

AT the meeting of the Whitechapel District Board of Works, on the 24th inst., Major Munro, representative of the district at the Metropolitan Board of Works, and chairman of the Finance Committee of that Board, said it was now desirable to make public a grave dilemma which for some time past had occasioned great anxiety to the Metropolitan Board, and must eventually prove a very serious matter for the ratepayers. The Artisans' and Labourers' Dwellings Improvement Act of 1875 was passed by the Legislature by acclamation, and under that Act the Royal Mint-street site was cleared nearly four years ago, and yet nothing had been done towards rebuilding on the land for the benefit of the working classes, as was the design of the Act. The land had been put up for sale by public auction, and not a single offer was made. But the Trustees of the Peabody Donation Fund had made a proposal to the Metropolitan Board to purchase the six sites cleared under the Act,—viz., the Bedfordbury, Great Wild-street, Pear Tree-court, Whitecross-street, and Old Pye-street, sites,—at a price based on a rental of 3d. per foot super., to be computed at twenty years' purchase; the price for that portion of the Whitechapel and Limehouse site now cleared to be 10,000*l.* If this was accepted it would be equivalent to a loss of 75,654*l.* on the Bedfordbury scheme, of 103,550*l.* on the Great Wild-street scheme, 13,939*l.* on the Pear Tree-court scheme, 336,973*l.* on the Whitecross-street scheme, 56,741*l.* on the Old Pye-street scheme, and 56,604*l.* on the portion of the Whitechapel and Limehouse scheme; or, taking the six areas in their entirety, the Metropolitan Board would lose the large amount of 643,461*l.*, the only set-off to which would be about 81,400*l.*, the value of the recoupment area not compulsorily set apart for artisans' dwellings, which the Board would retain. The Metropolitan Board had not accepted the offer of the Peabody trustees, but asked for a better bid; but the difference in their demand was comparatively trifling, and would do little to reduce the enormous loss to the ratepayers of London. The cost of clearing the six sites was 734,766*l.*, and the offer for them was only 91,300*l.*,—a difference of 643,461*l.* Of course, the fact that the land must be used for the specific purpose of erecting workmen's dwellings operated to immensely decrease its value in the open market. The commercial value of the recoupment area of the various sites, if utilised for general purposes, was estimated by Mr. Vulliamy, the Board's superintending architect, at 496,694*l.*, leaving a difference of 238,072*l.* on the total cost of acquisition. The same officer advised the Metropolitan Board that, in his opinion, the only alternative course to adopt calculated to relieve the Board from difficulty, and to place them in the best commercial position, would be for them to obtain an Act to enable them to erect the buildings. Valuable ground-rents would thus be created, or leases at moderate rack-rentals could be granted, and the whole property would thus become marketable. Major Munro added that he made this statement, the occasion for privacy having now passed, because the facts involved were of the gravest moment to the ratepayers, were a subject of considerable anxiety to the Metropolitan Board, and were suggestive of the tremendous financial difficulties which were the necessary result of carrying into effect the Artisans' and Labourers' Dwellings Improvement Act of 1875,—difficulties the extent of which were surely not contemplated by the Legislature, but which would prove a grievous burden to the ratepayers of London.

WHAT IS A GROUND FLOOR?

AN action has been brought in the Bloomsbury County Court (before Judge Bacon), by a barrister, residing at 37, Albert-street, Mornington-crescent, against the New River Company, to recover the sum of 3*l.* 6*s.*, of which it was alleged that 1*l.* 13*s.* had, during five years and a half past, been unlawfully charged him by the company for a high service.

The plaintiff, in support of his case, relied on the 36th section of the company's private Act of Parliament, 15 & 16 Vic., chap. 160, which is, "that the expression 'high service' in this Act shall mean and be considered as being a delivery of water at an elevation more than 10 ft. above the ground-floor of the dwelling-house or other place supplied."

The facts were that the delivery in question was only 8 ft. above what the plaintiff called his ground-floor, but more than 10 ft. above the level of the road in front of the house, and also more than 10 ft. above the lowest floor in the house, which the plaintiff contended should be and was the basement.

Plans were produced by both sides, and in support of his contention the plaintiff called Mr. R. C. Wright, of 92, High-street, Camden-town, builder, and Mr. Walter Simms, surveyor, manager to Mr. Kemp, of Albany-street, persons of experience, who gave evidence that this was the ordinary way of designating the floors in question. The plaintiff had paid the money not knowing for what he was charged; no particulars of the rates had been given by the company.

The measurements and payment of the money were admitted. The house is approached by a small flight of stone steps, so that the wooden floor (not to confound it with "floor" as used to designate a story) is raised about 3 ft. to 4 ft. above the level of the road. Counsel for the company contended that this floor was properly termed the entrance-floor, and that basement and ground-floor were synonymous, or expressed alike the floor resting on the ground below the house on the excavation. In support of this view he relied on the standard dictionaries, but called no witnesses.

The case was argued on the 22nd of May, and the judge reserved judgment; and on the 16th of June decided in favour of the company.

It may be remarked that, according to this decision, should an excavation for the lowest story be made any more than 10 ft. deep, and there be any delivery of water at the level of the road, the company will be entitled to charge extra for such delivery as a "high service."

This can hardly be the meaning of the Act.

The statement of counsel for the company, on which the decision was given was erroneous. The ground floor, according to custom, is the floor or story entered from the ground-level. Shops, as a rule, form the ground-floor. In Gwilt's "Encyclopædia of Architecture" the "Glossary" gives,—

"*Ground Plan.*—The plan of the story of a house level with the surface of the ground, or a few steps above it. It is not always the lowest floor, the basement being frequently beneath it."

To any one acquainted with building operations and the wording of specifications, Building Acts, &c., the reading of the clause in the Company's Act is clearly this:—High service shall be considered as being a delivery of water at an elevation more than 10 ft. above the [ceiling of the] ground floor [or story entered from the ground level] of the dwelling-house or other place supplied. Ground-floor and ground-story are terms interchangeably used to designate one of the vertical divisions of a building,—a series of apartments on the same level.

LANDLORD AND TENANT.

CAUTION TO HOUSE-OWNERS.

AT the Brompton County Court last week, Mr. Whist, the owner of a house in Brompton, sued Mr. Nelson, an architect, for 9*l.*, the alleged amount due in accordance with an agreement, for dilapidations and other liabilities, in respect to the house in question from September to February.

The plaintiff's case was that the house was taken under an agreement, by which the defendant was bound to preserve in good order or make good any damage to furniture (it being a furnished house), fixtures, or premises, the plaintiff covenanting to keep the place in tenantable repair.

On behalf of Mr. Nelson, the defendant, it was shown that soon after he entered into possession the servant and family were taken ill, and were declared to be suffering from blood poisoning; but the plaintiff's man, on being sent for, declined to take up the floor or empty the trap of the closet, and a builder was sent for, who did so, when the cause of illness was found to be in the accumulation of sewage filth, and an opening into a drain, which discharged foul air into the house.

After hearing all the evidence the judge held that the defendant was quite justified in employing a builder to take means to stop the evil, and endorsed the payment of 5*l.* on that account. He added that people suffering from the state of their houses in this way were not bound to wait the pleasure of the landlord. He found for the defendant on the set-off, and that 5*l.* paid into court was a full discharge of liabilities as to dilapidations.

LIGHT CASE.

WHEELDON *v.* BURROWS.

THIS appeal to the Court of Appeal, before Lords Justices James, Baggallay, and Thesiger, from a decision of Vice-Chancellor Bacon, raised a question of general importance as to the rights in respect of light as between the owners of adjoining plots of land which were purchased by them from a former owner of both the plots.

Mr. Samuel Tetley, who was the owner of some property in Derby, in the year 1875 put it up for sale by auction in lots. The plaintiff became the purchaser of lot 10, which was conveyed to her in fee simple by a deed dated the 6th of January, 1876, "together with all lights, easements, and appurtenances whatsoever to the said piece of land and hereditaments belonging or in anywise appertaining." The deed contained no express reservation to the grant or in respect of the property conveyed. In February, 1878, Tetley sold to the defendant by private contract a portion of the property which had not been sold

at the auction, and which had formed lot 6 at the auction. This lot adjoined the plaintiff's lot, and it consisted of a silk-mill and other buildings, some of the windows in which overlooked the plaintiff's land. On the 7th of April, 1876, Tetley conveyed lot 3 to the defendant in fee by a deed which contained general words similar to those contained in the conveyance to the plaintiff. In January, 1879, the plaintiff erected hoardings on the edge of her land against the defendant's windows, in order to assert her right to the uncontrolled use of her land, free from any right of the defendant in respect of light. The defendant thereupon knocked down the hoardings in order to assert his right to the access of light to his windows. The action was brought to restrain the defendant from committing a trespass by knocking down the hoardings. The defendant, by way of counter-claim, asked for an injunction to restrain the plaintiff from obstructing his light. The defendant alleged that his windows were, at the date of the conveyance to the plaintiff, apparent continuous easements necessary to the convenient enjoyment of the tenement which he afterwards purchased, and that they were impliedly reserved to Tetley, the grantor, and by him afterwards granted to the defendant, and that, consequently, the plaintiff was not entitled to obstruct them.

The Vice-Chancellor held that no right, either expressly or by implication, was reserved to Tetley in respect of the windows, and that, consequently, the defendant had no right in respect of them, and the plaintiff was entitled to build on her land so as to obstruct the windows. The defendant appealed. The Court dismissed the appeal with costs.

THE WAGES AND SUPPLY OF HOUSE PAINTERS.

A FEW weeks ago the Guardians of the Holborn Union invited tenders for painting their school buildings at Mitcham, and casual wards in Vine-street, Leather-lane, according to the specification of Mr. Snell, the architect, and received a tender from Mr. McArthy, of Dalston, to do the work at about half the amount of the next lowest tender, and about one-fourth of the highest; on which the Guardians took time to make inquiries, and found them satisfactory, and the tender was then accepted. At the meeting of the Board, however, on the 18th inst., a letter was received from Mr. McArthy, asking to be allowed an addition of 35*l.* to the amount of his tender, on the ground that he was required to send in his tender by the 20th of May, and was not informed of its having been accepted until the 17th of June, whereas he expected to receive the order to commence work at once, and since the time he sent in his tender the wages of painters had gone up considerably. Mr. Leaver, a guardian, remarked that he much doubted if the wages of painters had gone up, for the contractor for the works at the Clerkenwell Vestry-hall had advertised for painters, who were to apply at the Vestry-hall, and although he only wanted two or three, he was applied to by upwards of 200 painters, and there was a crowd of them standing about the Vestry-hall, and on its becoming known Mr. Dove, a builder, went and engaged one or two, and so did another. It looked as if the market for painters was well supplied, and it was not likely that wages had gone up. The application of Mr. McArthy was referred to the Building Committee. A guardian said that the Relief Committee (Clerkenwell) the day before had an application for out-relief from a painter, who, when in work, received 8*d.* an hour.

CHURCH-BUILDING NEWS.

Purleigh.—A fine new memoriam clock has just been placed in the tower of All Saints' Church, Purleigh, near Maldon, the gift of the Rev. R. Witherby, the vicar. It was made by the well-known firm of J. W. Benson, of Ludgate-hill and Old Bond-street. The clock strikes the hours on a tenor bell weighing about 12 cwt., and the time is shown upon two dials of copper, 4 ft. in diameter.

Codford St. Mary (*Wilts*).—On the 11th inst. this interesting little church, which has undergone restoration, was re-opened for public worship. The church is an ancient structure built of stone, and originally consisted of a nave and chancel, which are separated by a pointed arch springing from two columns with rudely ornamented capitals of Late Norman character. A south aisle was subsequently added. South of the chancel is an eastern chapel containing a tomb with a canopy over, supported by two arches and three columns, in the Italian style, and once having recumbent figures, now broken and gone. Hoare, in his "Modern Wiltshire" (Hundred of Heytesbury), attributes this tomb to John Mompesson, who died in 1645. With respect to the restorations which have just been completed, the roof is almost entirely recast, the timbers and tiles being new, and the interior plastered between the rafters. The walls have been re-coloured, the stone pavement of the passages and the chancel has been taken up and replaced with encaustic tiles throughout, and an entirely new floor has been laid down. The woodwork of the tower is entirely new, and the old and cumbrous gallery has been removed, throwing the light of the west window into the church. A large new window has been inserted in the south aisle, and another window has been placed in the east end of the chancel. A new west doorway has been built. The church has been re-seated throughout. A new warming apparatus has been provided, and a commodious vestry built. The architect for the works was Mr. E. H. Lingen-Barker, of Hereford. Mr. Harry Hems, of Exeter, executed the carved work; and Mr. William Balcombe, of Kenilworth, Warwickshire, was the contractor.

DISSENTING CHURCH-BUILDING NEWS.

Salisbury.—The new Congregational church here was opened on the 11th inst. The style adopted by the architects (Messrs. Tarring & Wilkinson, of London) is Early Decorated, the plan comprising nave and apse, with organ-chamber and two vestries (one on each side of the apse), and tower and spire at south-west angle, two entrances in the front and a side entrance to the vestries being provided. The walls of the church are of concrete, faced externally with Swanage stone in drop coursed work, having for dressings, &c., Corsham Down stone, and faced internally with brickwork, which is finished with Portland cement stucco. The ceilings are of plaster, with the main timbers of the roof exposed to view, thus forming panels. The joiners' work is in pitch pine, stained and varnished; the passages and centre of the apse have tiled floors laid to pattern. The large window in the apse is filled with a painted window, by Mr. Drake, of Exeter. The front is in Fisherton-street, and consists of gabled end of nave pierced with larger five-light tracery-head window, having attached columns on jambs, with carved and moulded capitals and moulded bases; under this extends sunk panelling in Bath stone, moulded strings being at the top and bottom of the same, and lower still are three single-light windows. On the left is one of the entrances, and on the right the tower and spire, connected with the nave by a vestibule. In the tower is the second front-entrance. The total internal length of the building is 105 ft. 6 in.; the width, 49 ft. 6 in.; the height of the nave is 50 ft., and the average height of the aisles 20 ft. The arcading of the clearstories is carried on Portland stone columns, with moulded capitals and bases. The tower and spire rise to a total height of 132 ft. to the top of the vane. The works have been carried out under the personal superintendence of the architects as follows:—the foundations to ground-line, by Mr. Tryhorn, at a cost of 403*l.* 10*s.*; the main building boundary walls, &c., by Messrs. Hales & Sons; the heating apparatus by Mr. Grundy, of Hackney, for 98*l.*

NEW MARKETS.

Manchester.—The new wholesale fish-market at Shudehill, erected by the corporation of Manchester, has been opened for business. The building has been erected from the designs (selected in competition) of Messrs. Mangnall & Littlewood. It covers an area of nearly 2,000 square yards, adjoining the old market, and faces New High-street on the one side, Thomas-street on another, and Little Stable-street on the third; on the fourth side is the old market. About 500 yards of the plot are utilised for shops and offices, with frontages to Thomas-street, thus leaving about 1,500 square yards of space for the extension of the market. The interior of the building is constructed in two bays, with avenues in the centre of each. The bays are each 45 ft. in width, and the roof is supported on cast-iron columns. The style of architecture adopted is Gothic, of a Continental type. The façade forms a series of four gables, faced with brick and stone, with an entrance in the centre of each. Emblematical figures illustrative of various branches of the fisherman's and the fish merchant's trade adorn the front of the building. The shops are divided only by iron partitions, which can be easily removed so as to throw any number of shops into one. The contract, which was for 15,200*l.*, was let to Messrs. Robt. Neill & Sons.

Liverpool.—The new market-hall at Holywell, Liverpool, was opened on the 10th inst. The necessity of having such a building, instead of having the markets held in the open air, as they have been from time immemorial, has long engaged the attention of the people of Holywell, and the Local Board determined to provide it. The site of the market is in the centre of High-street. The buildings have been erected from the designs of Messrs. Scrivener & Sons, Hanley, —the contractors being Messrs. Hughes & Son, Holywell,—and include a vegetable and butchers' market, to which are attached a fire-engine house and other offices. The vegetable-market is a parallelogram, 65 ft. long by 45 ft. wide, covered with a roof in two spans, with wrought-iron principals and pitch-pine boarding, and lighted by continuous skylights, and contains twenty-eight greengrocers' stalls and five fish-stalls. It communicates by a flight of nine steps with the butchers' market, which is an irregular parallelogram, about 69 ft. long by 48 ft. wide, giving accommodation to twenty-nine butchers' stalls and four shops. A town-hall is proposed in the scheme, and it is hoped that it will be erected by public subscription.

VARIORUM.

MR. WILLIAM J. THOMS, F.S.A., has published under the title "Exceptional Longevity" (Norgate, King-street, Covent-garden), a letter to Professor Owen, in which the veteran investigator demolishes a further batch of cases of asserted exceptional longevity, and is able to quote, in support of his views on the subject, a remarkable table on Centenarianism issued by Dr. Taché, the head of the Statistical Department at Ottawa. Mr. Thoms, speaking of the time, labour, and cost which he has himself expended on this inquiry, says feelingly:—"Let no one who has the slightest desire to live in peace and quietness be tempted, under any circumstances, to enter upon the chivalrous task of trying to correct a popular error."——"Flowers and Plants from Nature," by Emile Favart (Monteney, Nottingham), is a folio work now publishing in parts, two of which are before us. Each part contains five plates. The author "has attempted no classification of his groups, and has aimed at no artistic assimilations. He has endeavoured to give, with a pencil of nerve and faithfulness, the variety and tenderness of nature in her freest, least tutelaged, most abandoned moods." And let us add that he has succeeded to a very considerable extent. Draughtsmen in the decorative arts will find the publication very useful. The plates are good "copies," too, for those who are learning to draw, or wish to learn. ——Having purchased the copyright of David Roberts's "Holy Land," Messrs. Cassell, Petter, & Galpin are about to publish the work in monthly parts. Care is being taken to secure an accurate reproduction of the plates, for which purpose the illustrations are being re-drawn from the original folio edition.——The same firm are about to publish a work on Dairy Farming, written by Professor Sheldon, and dealing exhaustively with the subject, contemporaneously with the opening of the International Show at Kilburn.

The Artisans' Dwellings Act Extension Bill.—The Artisans' Dwellings Act Extension Bill seeks to remedy weaknesses in the Act of 1868. It provides for compensation to the owners of property taken possession of, the amount of such compensation to be awarded by the Government assessor or by a jury, as the owner himself may elect,—than which nothing can be fairer. The Bill enables local bodies to deal with the freeholder as well as the leaseholder, and thus to acquire absolute ownership of the sites; and it further empowers them either to erect houses for the accommodation of the working classes, or to let such sites on building leases. In cases where public bodies build the dwellings, such dwelling should be publicly sold within a given period of their erection, as it is undesirable for vestries to be extensive owners of property. If these powers are granted, it will make the task of providing decent house accommodation for the people at least possible; and if this is not then done, it will be in consequence of the apathy of the people themselves. It is to be hoped that the Government will not only not throw any obstacle in the way of the passing of the Bill, but that they will facilitate its passing this session; for theirs will be the responsibility if it is rejected.—*House and Home.*

Miscellanea.

Fossil Forests in America.—In the valley of the east fork of the river which flows through the wonderful Yellowstone National Park of the United States, the group of rocks, known for want of a better designation as the "Volcanic Tertiary," is typically developed, and has a thickness of upwards of 5,000 ft. Its prevailing materials are fragmentary volcanic products which have been apparently redistributed by the agency of water, and now form breccias, conglomerates, and sandstones. These strata contain a great abundance of silicified wood; and in many places trunks of trees, many feet in height and of gigantic proportions, seem to stand in the identical strata in which they grew. Mr. W. H. Holmes gives an account of these forests in the recently-published number of the fifth volume of the "Bulletin of the United States Geological and Geographical Survey." Riding up the smooth river-bed, one has but to look to the right up the cliffs to discover multitudes of the bleached trunks of these ancient forest trees. In some of the steeper portions of the mountain's face rows of upright trunks stand out like the columns of some long-since ruined temple. On the more gentle slopes lower down, but where it is still too steep to support vegetation, save here and there a few pines, the petrified trunks fairly covered the surface, and were at first taken to be the shattered remains of a quite recent forest. Sometimes the trunks were found in a fine state of preservation. Some lying prostrate measured 50 ft. to 60 ft. in length, and not a few of these were 5 ft. or 6 ft. in diameter. One, indeed, was found, on careful measurement, to be 10 ft. in diameter. The woody structure was so well preserved that it could be at once declared that this giant tree was not a conifer.

The Government of London.—Referring to this subject, the correspondent of the *Manchester Guardian* writes:—"We have 39 local governments, most of them vestries, which impose and collect in their separate jurisdictions the School Board rate. London government has a confusion quite peculiar. The School Board division of London is conterminous with the Parliamentary division, and that is the only agreement. Our 39 local governments do not correspond with anything. We have 19 police-districts, and 15 police-court districts; we have 13 county-court districts, and 10 postal districts; the Registrar-General divides us into 37 districts; we are partitioned into 44 surveyors' districts; we have 15 militia districts; we have eight water companies, and consequently have experienced a water famine in one district, while there was an abundant supply in the mains of another company within 100 yards of the district; we have about the same number of gas companies; we have a corporation of Westminster as well as of the City of London; we have confusion of coroner; and, lastly, we have conservators of the Thames, by whose permission we are still drinking the sewage of Oxford."

London Bridge.—The Council of the Royal Institute of British Architects, at a full meeting of their body held on the 23rd inst., unanimously expressed their regret at the nature of the proposal now before Parliament for widening London Bridge. They are convinced that if the width of the bridge must be increased, the right way to do it is by adding what may be required in masonry of exactly the same design as at present, the only objection to which appears to be the cost. They feel sure, however, that it cannot be necessary on the ground of false economy to execute the required work in a manner that must involve the destruction of the original design of the bridge.

Haworth Church.—At a Consistory Court held in the cathedral, Ripon, a faculty was granted to pull down the whole of the fabric of Haworth Church excepting the west tower, and improve and restore the church. Mr. T. Empsall, Dr. Maffey, and Colonel Barras, of Bradford, entered protests against the old church being demolished, and presented a petition; but there being no legal opposition, the faculty was granted.

Newcastle-on-Tyne.—Designs for the proposed new church of St. Luke, Upper Claremont, a district in the parish of St. Andrew, have been prepared by Messrs. Oliver & Leeson, and have been approved by the Bishop of Durham and the corporation of Newcastle.

The International Agricultural Exhibition.—The work at Kilburn is progressing well, notwithstanding the weather. The sheds for the sheep and cattle will be ready in ample time; the offices are almost complete, and a very short time will be sufficient for the completion of the members' club, the restaurants, and *café*. Our readers know that the show will be held at Kilburn, upon a piece of ground of about 100 acres lying in the Salusbury-road. The new Salusbury-road Station of the London and North-Western Railway and the Kensal-green Station of the North London Railway are adjacent to the grounds. From the Mansion House, also, visitors may travel by the District Railway. By omnibus the ground may be reached from the Edgware-road Station in a quarter of an hour, from Cheapside or Newgate-street the journey will occupy an hour, and half an hour must be allowed if the omnibus be entered at the Marble Arch. The exhibition opens on Monday, the 30th inst., and will continue during the six following days (Sunday excepted). Every morning butter and cheese making on the English, French, Danish, Swedish, Holstein, and Limberg systems will be shown in working. For this purpose a building 150 ft. in length by 40 ft. in breadth has been prepared. The furniture and upholstery of the Royal box is supplied by Messrs. Jackson & Graham, of Oxford-street. The canvas roofing of the sheds is supplied by Mr. Unite, of Edgware-road, and is insured for 6,000*l*. The total length of sheds is eleven miles and a half. A royal pavilion for her Majesty and the Prince of Wales is also being erected by Mr. Unite.

Society of Arts.—The Council of the Society of Arts have awarded the following medals for papers read during the past session of the Society:—To Mr. Alfred Haviland, M.R.C.S., for his paper on the "Distribution of Disease Popularly Considered"; Mr. John Hollway, for his paper a "New Application of a Process of Rapid Oxidation, by which Sulphides are Utilised as Fuel"; Mr. Conrad W. Cooke, for his paper on "Edison's New Telephone"; Mr. Thomas Wardle, for his paper on the "Wild Silks of India, especially Tussah"; and Dr. Wm. Wallace, F.R.S.E., for his paper on "Gas Illumination." The thanks of the Council were also voted, as follows, for papers read by members of the Council, who could not, therefore receive medals:—To Mr. Hyde Clarke, for his paper on "Railways to Turkey and India"; Dr. George Birdwood, C.S.I., for his papers on "Indian Pottery at the Paris Exhibition," and "Quest and Early European Settlement of India"; Mr. B. Francis Cobb, treasurer of the Society, for his papers on "Some Causes of the Recent Depression in Trade," and "Retrospect and Prospect in Egypt"; and Mr. W. H. Perkin, F.R.S., for his paper on the "History of Alizarin and Allied Colouring Matters, and their Production from Coal Tar."

Rock Drilling by Electricity.—M. Gaston Planté, in his "Recherches sur l'Électricité," mentions a new application of electricity which had not been hitherto published by him, and which is of considerable interest. After describing the process of engraving on glass by electricity that he made known in 1877, and the account of which has been so widely copied by scientific papers, M. Planté goes on to say:—"We have seen that one of the electrodes conducting an electrical current of a certain tension, being brought in contact with glass, in the presence of a saline solution, it acts like a graver or diamond by tracing grooves in the surface of the glass, and even digs into it quite deeply. In spite of its great hardness, rock crystal can also be attacked by the same method; and, if not engraved regularly, it at least cracks into small fragments, and is finally disintegrated." In view of this, M. Planté suggests that the electric current, under conditions analagous to those above described, might be substituted for diamonds in the operation of drilling rocks.—*The Electrician.*

The Isthmus of Panama.—At the concluding sitting of the International Literary Congress, held under the presidency of the Comte Ferdinand de Lesseps, the chairman announced that he had received a letter from his son, stating that the whole of the 2,000,000 francs required for the preliminary expenses of the canal through the Isthmus of Panama had been already obtained, and that, consequently, the works might be commenced immediately.

The Wilberforce Memorial Church.—A portion of the new church of St. Mary, Southampton, which is intended to form a memorial of the late Bishop Wilberforce, and to replace the old parish church, has been consecrated. The foundation-stone was formally laid by the Prince of Wales on August 12th last, so that within a year the chancel, chancel-aisles and vestries, and one section of the new nave, have been erected and completed for use. The remaining four bays of the old church, which was erected in 1711, with materials taken from the ruins of Netley Abbey, will be taken down and replaced as soon as there are funds sufficient in hand to proceed with the work. For the part already finished the expenses incurred amount to nearly 10,000*l*. Mr. Street is the architect. Swanage rag-stone has been used for the outer walls, with Bath stone dressings, and the latter kind of stone has been employed in the interior generally, though the open tracery of the choir-screens and other finer work is of Corsham Down stone. An alabaster pulpit, with panels of marble mosaic, has been presented by the Rev. H. Robinson, rector of St. Paul's at St. Leonard's-on-Sea; a brass lectern and several stained-glass windows have also been presented.

A Series of Manuscripts.—The Exhibition at the new Museum, Rugby, will include a series of ancient deeds and charters from the large collection of Mr. R. H. Wood, F.S.A., Rugby. Beginning with a MS. of the Carlovingian era, about 950, there will be a charter of every reign from William the Conqueror to the present time, and a great number will be shown of the earlier reigns down to the end of the thirteenth century. Many of them are exquisite specimens of the writing of the period, and are, notwithstanding their great age, in wonderful preservation. The seals of the fourteenth and fifteenth centuries will be well represented. There will be a fine display of the heraldic seals of this epoch, during which the art of seal-engraving reached its highest state of excellence; also a number of curious Papal documents from the Monastery of Vallambrosa, one bearing the early date 1042. The student will note the changes that have taken place in writing in each successive age, and he will remark the gradual decadence from the clear and distinct writing of the time of King John and Henry III. to the almost illegible cursive hand of James II. and Queen Elizabeth. We believe that so complete a chronological series has never before been brought together.

The First Steel Bridge in America.—Arrangements have been concluded by Gen. D. D. Smith, chief engineer of the Chicago and Alton Railway, for constructing the first all-steel bridge in America. Gen. Smith will be remembered by his connexion with the U. S. Government Board for Testing the Strength of Iron and Steel experiments which were carried on by him several years ago. His researches have at last brought him to the conclusion that steel bridges can be built cheaper than iron, and be equal in durability. The bridge will be erected over the Missouri river on the Chicago and Alton Railway. It will be of five spans of 350 ft. each. The elevation over high-water mark will not be less than 80 ft., at which height the light steel rods of the "Howe truss" will look like silver cobwebs glimmering in the sunshine. For all its frail appearance, the bridge will have a strength reached by but few existing structures in the world. The total amount of steel used in the construction will be about 1,500 tons, equivalent to almost double that quantity of iron.—*Am. Journal of Industry.*

Malton Board of Health.—Last week an adjourned meeting of the Malton Local Board of Health was held at the Town-hall, for the purpose of appointing some one to the combined offices of surveyor of roads, inspector of nuisances, and inspector of buildings, rendered vacant by the dismissal of Mr. Buckham. Ultimately, Mr. John L. Webster, of York, aged twenty-five, who is an assistant in the office of Mr. Penty, architect and surveyor, York, surveyor to the York Rural Sanitary Authority, was appointed.

Monumental.—A marble statue of the late Sir John Gray, M.P., which has been erected in Sackville-street, Dublin, in remembrance chiefly of his services to the citizens of Dublin in obtaining a water supply and superintending the execution of the scheme, but also for his political exertions, has been unveiled. The statue is the work of Mr. Farrell, a Dublin sculptor, and is an excellent likeness.

Railway Refreshments.—We are enabled to travel rapidly upon our railways, but we have not yet succeeded in inducing the companies to provide us with good refreshment-saloons or waiting-rooms. At many metropolitan stations there is no lack of refreshment-bars, sometimes three at one station, but often at the same time the necessary waiting-room is altogether wanting. It is, however, interesting to read of the advantages possessed by the people of other lands, even if we cannot hope to enjoy them, and there is something very refreshing in the description of the "dining-cars" which have recently been added to some of the through trains in Canada. From half-past five until eight o'clock supper is served in the through trains of the Grand Trunk Railway, and consists of a very good *table d'hôte* served at 3s. a head. Certainly the *menu* presents a most tempting array of delicacies, and causes us to indulge in bitter reflections concerning the scalding tea and soup and the venerable buns that form the stock of many of our refreshment-rooms. We do not ask for dining-cars,—they will, perhaps, come in due time,—but we ought to be provided with better accommodation for eating and drinking at the railway-stations.—*Pictorial World.*

Narrow Escape of a Liverpool Architect.—On the 17th inst., Mr. Charles Wise (of the firm of Holt & Wise, architects), was engaged in surveying some machinery recently erected in a jigger-loft of one of the warehouses near the Sailors' Home, and while in the act of stepping over the main shaft, some part of his clothing was caught by the revolving-shaft, to which he was dragged. Fortunately there was near it an upright column, to which he clung until a great deal of his clothing was dragged from his body, and he was terribly bruised on one side. Unfortunately he was alone, and his cries for help from the top of a seven-story warehouse, amid the noise and din of machinery and the street traffic, were not heard. He was conveyed to the Royal Infirmary, but in the course of the evening his friends were enabled to remove him to his residence.

The Society for Improving the Condition of the Labouring Classes.—The thirty-fifth annual meeting of this Society was held on Wednesday afternoon at Willis's Rooms, St. James's; the Earl of Shaftesbury in the chair. The secretary read the annual report for 1878-79, giving details of the occupation of dwellings, the use of public washhouses, &c. The receipts from all sources during the year were 7,181*l.* 11s. 6d., which, with a balance in hand at the beginning of the year of 467*l.* 19s. 8½d., made a total of 7,649*l.* 11s. 2½d. The total expenditure amounted to 7,173*l.* 16s. 7½d., leaving a cash balance of 475*l.* 14s. 7d. The property belonging to the society was estimated as worth 34,206*l.* 6s. 10d., and the general liabilities amounted to 19,937*l.* 4s. 10d., leaving assets to the amount of 14,269*l.* 2s.

The Alexandra Orphanage, Hornsey.—The Prince and Princess of Wales on Tuesday last opened some new buildings at the Alexandra Orphanage, Hornsey,—a branch of the Orphan Working School. The buildings include a new schoolroom, apartments for teachers, a laundry, boiler-room, storage, &c. The playground has been enlarged, and accommodation is now provided for 200 children, The building is of red brick externally. The architect is Mr. Alfred R. Pite.

Royal Italian Opera.—"Un Ballo in Maschera" has introduced M. Lassalle, the French baritone, in a new and very effective part. M. Lassalle's impersonation of the injured husband was the great feature of interest in the representation. M. Lassalle plays the part with dignity and pathos. Mdlle. Turolla's careful singing and intelligent acting were valuable in the part of *Amelia*, and Madame Scalchi, as before, was the representative of the sorceress, *Ulrica*.

Wilson & Co.'s Alkaline Composition.—We have tried the sample sent to us of Wilson's composition for removing old paint from wood, and found it effect that purpose in a shorter time, and more effectually than any other process that has been brought under our notice. If the composition in bulk is as effectual as the sample sent to us, it will be found a valuable adjunct by those who require paint to be removed.

Australian Timber.—The *Brisbane Courier* says:—Mr. Walter Hill has been sent on a tour of inspection to Frazer Island, where it is reported some valuable timbers flourish, notably the kaurie pine. For some time past the curator of the Botanical Gardens has been giving his attention to the propagation of some of the most valuable of our indigenous timbers, and at Oxley Pocket has formed a nursery of red cedar trees, in which 30,000 plants have been reared, all of which are in a flourishing condition, ranging from 2 ft. to 6 ft. in height. These are intended for distribution, and Mr. Pettigrew has already received 5,000 for his Dundathu estate. Possibly the thought that the red cedar takes from 60 to 100 years to attain its best development may discourage many from attempting its cultivation. The measures that seem demanded of us now, we imagine, should take a more restrictive than reproductive form. There is yet plenty of cedar in some of our forests, as a late telegram, announcing the sweeping out to sea of several million feet in consequence of a freshet in the Mossman, Dainree, and Johnston rivers, assures us. Some enactment is required that shall allow the colony to reap some benefit from its wealth of timber, as well as prevent its wanton waste.

Technical Education for Turners.—The Turners' Company's competition this year will be in respect of turning in wood, stone, iron, steel, brass, and gun-metal. As regards wood, both hard and soft material may be used, but the work must be all hand-turning, produced in the lathe without special rest or tool apparatus. The competition in stone excludes china and pottery, but comprises natural substances such as porphyry, granite, jasper, agate, marble, jet, alabaster, and similar materials. The qualities to be considered will be beauty of original design in shape and colour, or accuracy in copying, skill in overcoming difficulties in regard to material, and originality and novelty. In the iron and steel class the chief award will be adjudged to the best specimen of pure turning. In each instance the first prize will consist of a silver medal and the freedom of the company and of the City of London, and the Baroness Burdett-Coutts and the Court of the company have contributed 100*l.* for other prizes. The exhibition will be at the Mansion House from the 7th to the 9th of October next.

The Thames Valley Drainage. — The Lower Thames Valley Sewage Board resolved last week, by a majority of one, to apply for a provisional order to carry out Lieutenant-Col. Haywood's scheme for the drainage of the Lower Thames Valley. A private Bill for the same object was rejected in the early part of the present session of Parliament. The scheme is estimated to cost 270,000*l.*

Waterloo Road.—The Hospital for Women and Children in the Waterloo-road, Lambeth, is undergoing extensive alterations and improvements. A dramatic entertainment has been recently held at Grosvenor House in aid of the funds. Mr. Ralph Nicholson, of Westminster, is the architect, the works being carried out by Mr. Edward Howard, builder, Upper Baker-street.

Sanitary Appliances and Books, Sydney International Exhibition.—We are requested to intimate that Mr. Wahab, C.E., is about to proceed to Sydney, taking with him a Special Collection of Sanitary Exhibits. It is hoped that the makers of sanitary requisites will support him in giving prominence to this new feature of modern civilisation.

Eddystone Lighthouse.—Stress of weather prevented the laying of the foundation-stone of this structure on Saturday last, as intended. Some particulars of the new lighthouse, and of the one which it is to replace, were recently given by us, together with a view of Smeaton's structure. (See pp. 243, 257, *ante*.)

St. James's, Darlington.—The Ecclesiastical Commissioners have approved of the drawings of Mr. G. G. Hoskins, architect, of Darlington, for a parsonage-house to be built on a site in the Haughton-road, and south of the recently erected church.

Royal Academy.—At a general assembly of Royal Academicians on the 19th inst., Mr. Alma Tadema was elected a full Academician, and Mr. G. H. Boughton and Mr. Hubert Herkomer were admitted Associates.

TENDERS

For enlarging the Home at 35, Eden-grove, Holloway, for the Committee of the London Female Preventive and Reformatory Institution. Mr. W. P. Griffith, architect. Quantities not supplied:—

Dunford & Langham	£743 0 0
Lidstone	690 0 0
Grover	684 0 0
Pocock	675 0 0
Moreland & Nixon (accepted)	663 0 0

For internal repairs, and for repairing the dwarf walls and railings of the churchyard of St. James, Clerkenwell. Mr. W. P. Griffith, architect:—

Cornwell (accepted)	£202 0 0

For sewers for the Bromley Local Board:—

Nowell & Robson	£44,641 5 2
Simmons	44,541 12 6
King	44,260 0 0
Marshall	40,484 8 6
Mackenzie & Co.	40,476 0 0
Hunter	40,005 2 6
Neave & Son	39,553 13 8
Woodham	35,689 0 0
Killingback	34,200 0 0
Barnes	31,500 0 0
Potter (accepted)	29,758 11 0
Geen	29,017 5 0
Young & Williams	28,429 0 0

For alterations and additions to premises in Milford-street, Salisbury, for the Salisbury Coffee Public-house Company (Limited). Mr. Fred Bath, architect:—

Witt & Tryhorn	£300 0 0
Hale & Sons	299 1 5
Young & Sons (accepted)	262 0 0

For new shop-fronts to premises, Market-street, Poultry-cross, and Butcher-row, Salisbury, for Mr. A. M. Melville. Mr. Fred Bath, architect:—

Walker	£300 0 0
Young & Sons	119 18 9
Harris (accepted)	109 10 0

For additions to premises, Market-place, Salisbury, for Mr. H. B. Wells. Mr. Fred Bath, architect:—

Hale & Sons	£800 0 0
Tryhorn	757 0 0
Young & Sons (accepted)	739 10 0

For the erection of the Maunder Memorial-hall in Fisherton-street, Salisbury. Mr. Fred Bath, architect. Quantities supplied:—

		Extra for Panelled Framings.
Foley	£1,598 0 0	£101 0 0
Hale & Sons	1,261 0 0	61 0 0
Tryhorn	1,248 0 0	45 15 0
Young & Sons*	1,180 0 0	74 0 0

* Accepted for first portion, £959.

For warehouse, Old Swan Wharf, for Messrs. Knight & Morris. Mr. E. Power, architect. Quantities by Mr. Walter Barnett:—

Rider & Son	£2,682 0 0
Brass	2,537 0 0
Lister	2,440 0 0
Colls & Sons	2,400 0 0
Green	2,385 0 0
Braid & Co.	2,375 0 0
Toms	2,365 0 0
Boyce	2,253 0 0
Fish	2,250 0 0
Andrews	2,242 0 0
Conder	2,193 0 0
Hunt	2,070 0 0
Taylor & Son	2,035 0 0
Greenwood & Sons (accepted)	1,957 0 0

For the Chiswick Main Drainage. Mr. H. O. Smith, engineer:—

	Contract No. 8.	Contract No. 9.
Keeble	£18,000 0 0	£5,000 0 0
Williams, Son, & Wallington	17,860 0 0	4,930 0 0
Mears	17,210 0 0	4,740 0 0
Dickenson	17,050 0 0	4,500 0 0
Killingback	16,900 0 0	4,300 0 0
Nowell & Robson (accepted)	15,950 0 0	3,990 0 0

For the erection of additional stables for the Kensington Vestry. Mr. W. Weaver, C.E. architect. Quantities by Mr. W. E. Stoner:—

		Allow for Old Material.
Parkinson	£4,780 0 0	—
Adamson	2,917 0 0	£35 0 0
Hockley	2,835 0 0	70 0 0
Mears	2,810 0 0	40 0 0
Brass	2,670 0 0	—
Braid & Co.	2,560 0 0	—
Waters	2,524 0 0	49 0 0
Lucas & Son	2,512 0 0	—
Thorn	2,500 0 0	25 0 0
Wall (accepted)	2,260 0 0	20 0 0

For the erection of a villa residence at Lonsdale-place, Derby, for Mr. Robert Boughton. Mr. Geo. R. Isborn, architect. Quantities supplied:—

Thomson	£1,580 0 0
Bakewell	1,170 0 0
Jno. Wood	1,120 0 0
Edwd. Wood	1,095 0 0
Dickenson	980 0 0
Walkerdine	950 0 0

For alterations and additions, &c., to the Finsbury Park Tavern, Seven Sisters-road, for Mr. Hollis. Messrs. Bird & Walters, architects:—

Anley	£1,560 0 0

For addition to brewery, 311, Hackney-road, for Messrs. West & Pegg. Mr. Joseph Harris, architect:—

Anley	£1,050 0 0

For painting works at Royal Hospital for Incurables, West-hill, Putney. Messrs. Searle, Son, & Hayes, architects:—

Pitman & Son (accepted).

For alterations and addition at Buckhurst, Wokingham, Berks, for Mr. Charles Townshend Murdoch. Mr. E. Power, architect. Quantities by Mr. Walter Barnett:—

Watson	£2,400	0	0
Mann	1,935	0	0
Conder	1,921	0	0
Hunt	1,827	0	0
Henderson	1,819	0	0
Boyce	1,783	0	0
Toms (accepted)	1,775	0	0
Braid & Co. (withdrawn)	1,418	0	0

For alterations and additions at Mouflet's Hotel, 24, Newgate-street, for Mr. C. S. Young. Mr. E. Power, architect. Quantities by Mr. W. Barnett:—

Green	£293	0	0
Ramsey	265	0	0
Toms	238	0	0
J. & J. Lister	235	0	0
Mann (accepted)	215	0	0

For warehouse, Bury-street, St. Mary-axe, for Mr. H. J. Fitch. Messrs. Hammack & Lambert, architects:—

A. Robinson	£9,497	0	0
Browne & Robinson	9,260	0	0
Brass	8,723	0	0
G. Smith & Co.	8,718	0	0
Ashby, Bros.	8,638	0	0
Nightingale	8,472	0	0
Bangs & Co.	8,432	0	0

For alterations at the Ebor Arms, Stoke Newington, for Messrs. Mann, Crossman, & Paulin. Mr. Ernest Shum, architect:—

Langmead & Way	£645	0	0
Wilson	620	0	0
Braggins	598	0	0

For cottages at Potter's Bar, for Mr. George Paulin. Mr. Ernest Shum, architect:—

Fairhead	£975	0	0
Patman & Co.	938	0	0
Brown	787	0	0
Braggins	745	0	0

For a new beer-house at Southgate, for Messrs. Mann, Crossman, & Paulin. Mr. Ernest Shum, architect:—

Cole	£1,135	0	0
Braggins	1,055	0	0
Brown	927	0	0
Newby (too late).			

For construction of concrete sewers on the Aldrington Estate, near Brighton:—

C. Drake & Co.	£2,400	0	0!
Oliver	1,800	0	0
Earnshaw	1,705	0	0
Harrison	1,583	0	0
Marshall	1,540	0	0
Hitchcock (accepted)	1,400	0	0!

For enlarging "Fairlight," Kingston-hill, for Major R. B. Lawes. Mr. F. Boreham, architect:—

Horlock (accepted)	£1,250	0	0

For painting and decorative works at the Gresham Club, King William-street, City. Mr. T. E. Knightley, architect:—

Mann	£520	0	0
Kidgell	387	0	0
Pitman & Son (accepted)	343	0	0

For alterations and additions at and in rear of the Crown Hotel, Lavender-hill, Wandsworth, for Mr. Saml. Bowker. Mr. J. C. North, architect:—

Turtle & Appleton	£488	0	0
Holloway	485	0	0
Newton & Triggs (accepted)	380	0	0

For restoring Little Welnetham Church, Suffolk. Mr. Drayton Wyatt, architect:—
Grimwood & Sons (accepted).

For restoring Cockfield Church, Suffolk. Mr. W. M. Fawcett, architect:—
Grimwood & Sons (accepted).

For the erection of factory premises and stabling at Maiden-crescent, Kentish Town, for Mr. Fredk. William Rowney. Messrs. Ebbetts & Cobb, architects. Quantities by Messrs. Hodgson & Mundy:—

Everett & Son	£19,125	0	0
Aitchison & Walker	18,875	0	0
Macey & Sons	18,431	0	0
Nightingale	18,181	0	0
Perkins	17,753	0	0
Longmire & Burge	17,690	0	0
Wagner	17,400	0	0

For repairs, alterations, and decorations to Westminster Chapel, James-street, Buckingham-gate. Messrs. Satchell & Edwards, architects:—

Sprake & Foreman	£3,240	0	0
Phillips & Son	3,055	0	0
Harrison & Wood	2,467	0	0
Belham & Co. (accepted)	2,275	0	0
Sanders (withdrawn)	1,935	0	0

For new class-rooms and alterations to the Congregational Chapel, Andover:—

Beale (accepted)	£434	0	0

For alterations and repairs to the Catherine Wheel, Andover, for the Coffee Public-house Co., Limited. Mr. J. Hillary, architect:—

Beale (accepted)	£319	0	0

For the erection of Ealing College. Mr. W. Willey, architect. Quantities not supplied:—

Hook & Oldrey	£3,789	0	0!
Waters	3,351	0	0
Penny	2,698	0	0
Temple & Foster	2,450	0	0
Haynes	1,899	0	0!

For rebuilding No. 239, Tottenham-court-road. Mr. D. R. Dale, architect. Quantities by Mr. J. Vaughan:—

Laurance	£7,997	0	0
Conder	7,792	0	0
Hoare	7,476	0	0
Nightingale	7,182	0	0
Macey (accepted)	6,750	0	0
Hart	6,656	0	0
Wagner	5,800	0	0

For alterations to the Carpenters' Arms Public-house, Kingsland-road:—

Jackson & Todd	£525	0	0
Eaton	515	0	0
Gill	415	0	0
Wheeler	397	0	0

For alterations at the New Inn, No. 9, Bulstrode-street, Marylebone, for Mr. Henry Emanuel:—

Toms (accepted)	£347	0	0

For alterations, repairs, and new shop-front at 8, Philpot-lane, City. Mr. E. Hide, architect:—

Parker & Evans (accepted)	£364	0	0

For alterations, &c., to Newport Villa, Church-road, Norwood, for the Executors of the late Mrs. Davies:—

W. & S. Nottle	£605	0	0
Jinks	493	0	0
Poole	485	0	0
Marriage	465	0	0

Army and Navy Stores, Regent-street.—Messrs. Braid & Co. wish it to be understood that the contractors whose tender was accepted were in truth the lowest when the amount allowed by them for old materials was deducted.

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